INSTRUMENTATION— a cure-all for kiln troubles?
See page 139

Rock Products

JUNE 1957

THE INDUSTRY'S RECOGNIZED AUTHORITY

Here's some really big equipment!

Rion Crush Stone services their customers with some of the largest crushers and screens ever built

See page 106

From worked-out mine to storage warehouse . . .

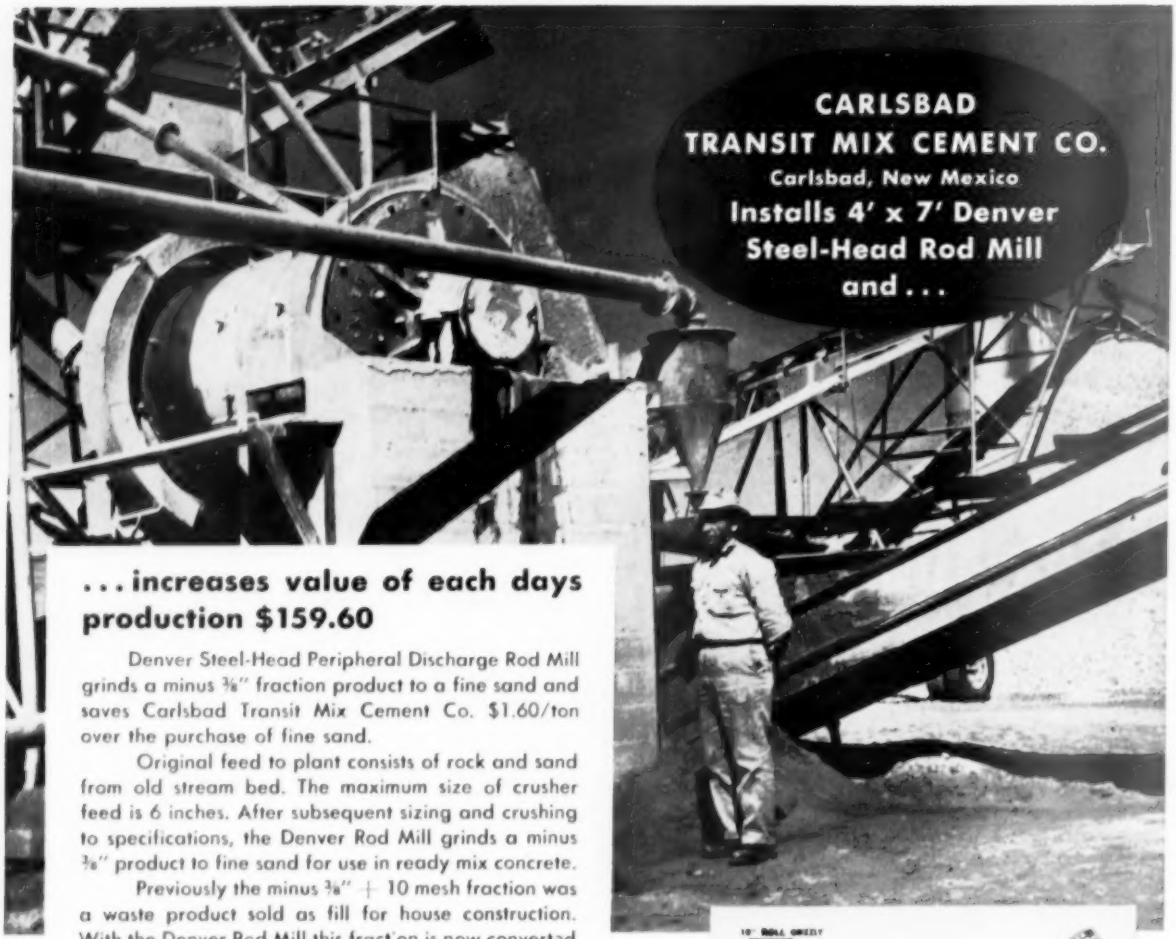
With a minimum of time, money and labor a limestone mine was converted into an underground storage warehouse

See page 94

Cement plant expands— twice within five years

Not just minor programs but two full-scale expansion plans that have more than doubled capacity

See page 90



CARLSBAD TRANSIT MIX CEMENT CO.

Carlsbad, New Mexico

Installs 4' x 7' Denver Steel-Head Rod Mill and . . .

. . . increases value of each days production $159.60

Denver Steel-Head Peripheral Discharge Rod Mill grinds a minus ⅜" fraction product to a fine sand and saves Carlsbad Transit Mix Cement Co. $1.60/ton over the purchase of fine sand.

Original feed to plant consists of rock and sand from old stream bed. The maximum size of crusher feed is 6 inches. After subsequent sizing and crushing to specifications, the Denver Rod Mill grinds a minus ⅜" product to fine sand for use in ready mix concrete.

Previously the minus ⅜" + 10 mesh fraction was a waste product sold as fill for house construction. With the Denver Rod Mill this fraction is now converted to a useable sand product. The increase in value of this feed to the Denver Rod Mill, taken out as sand, is now estimated at $1.60/ton, or $159.60 per day. Feed to the Denver Rod Mill is approximately 12T/HR. The plant operates at approximately 50T/HR.

If you have a size or separation problem in meeting your aggregate requirements, consult us without cost or obligation. Perhaps we can help you solve your problem and increase profits.

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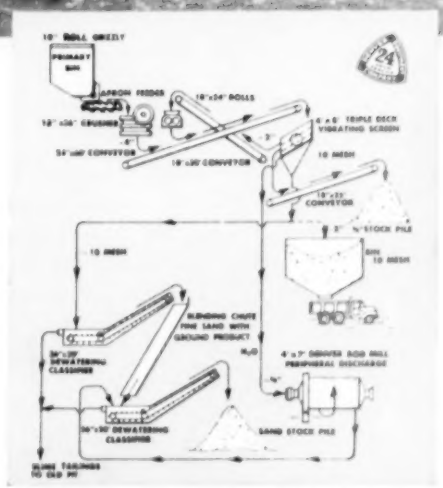
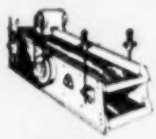


Flow sheet shows installation of 4' x 7' Denver Rod Mill which grinds minus ⅜" fraction to fine sand at a saving of $1.60/T.

DENVER JAW CRUSHER



DENVER-DILLON VIBRATING SCREEN

DENVER STEEL HEAD BALL MILL

DENVER AUTOMATIC SAMPLER

DENVER ROLL CRUSHER

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B.F.Goodrich report:

Rubber turns a mountain inside out

B. F. Goodrich improvements in rubber brought extra savings

Problem: This is part of a 7-mile-long tunnel that will carry billions of gallons of water to a power plant. In digging the tunnel, they've practically turned a mountain inside out.

As fast as dirt and rocks (some of them boulders weighing 3000 pounds each) are blasted out, they're dumped on a rubber belt and carried away. But the smashing blows of 1½ ton rocks were pounding conveyor belts to death. Some split in two; others had their covers ripped off.

What was done: B.F.Goodrich engineers were asked to develop a belt that could stand the abuse. They started with the B.F.Goodrich cord belt, so called because it has cords running lengthwise, buried in rubber. To this they added several layers of Nylil fabric, which gives extra strength to the belt without making it heavy and bulky. Special rubber compounds were used for the cover to stand the cutting and gouging of the rock.

Savings: The B.F.Goodrich belt was put to work here. It stood the banging, crashing better than any belt previously used. It lasted longer, carried more tons. B.F.Goodrich belts have now carried two-thirds of all the rock hauled out of here.

Where to buy: Your B.F.Goodrich distributor has full information on the conveyor belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-951, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

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JUNE 1957

FEATURES

DEPARTMENTS

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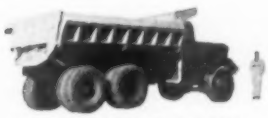

BD TRUCK BODY

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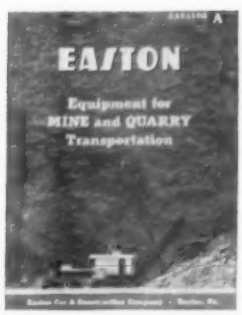

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This new sales policy applies throughout the United States and Canada. For export sales consult our New York Office: 50 Church Street, New York 7, N. Y.

B-1076

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One DRILLMASTER replaces four churn drills!

AT the above open pit mine, one DRILLMASTER is now doing the work formerly requiring four churn drills. It is sinking 6" blast holes to a depth of 75 to 180 feet, with a 15 foot hole spacing and 20 to 25 foot burden. *All blast holes are drilled by the Drillmaster at a 15° angle from the vertical in order to take full advantage of bedding planes and to overcome a severe toe problem.* DRILLMASTER Carset Jackbits are delivering a total life of up to 4000 feet of hole.

The "down the hole" Depth-Master drill is a feature of the Ingersoll-Rand DRILLMASTER. Going down the hole with the bit, it applies full drilling impact directly to the bit at any depth of hole. Thus the power losses in long drill steels are avoided. The DRILLMASTER can also be used as a Rotary drill or as an "out of the hole" Power-Master drill.

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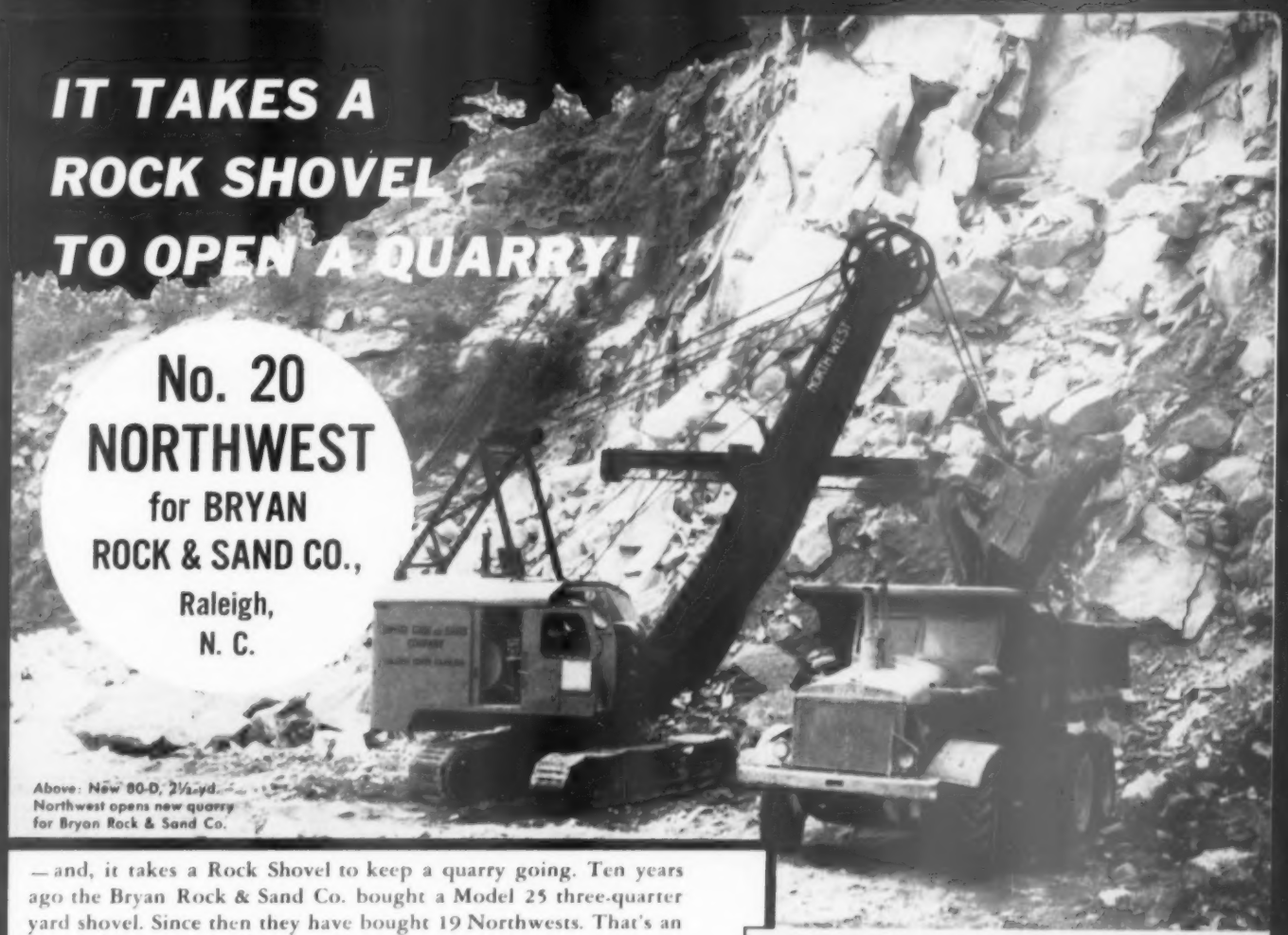
IT TAKES A ROCK SHOVEL TO OPEN A QUARRY!

No. 20 NORTHWEST for BRYAN ROCK & SAND CO., Raleigh, N. C.



Above: New 80-D, 2½-yd. Northwest opens new quarry for Bryan Rock & Sand Co.

—and, it takes a Rock Shovel to keep a quarry going. Ten years ago the Bryan Rock & Sand Co. bought a Model 25 three-quarter yard shovel. Since then they have bought 19 Northwests. That's an average of two a year.

The business of Bryan Rock & Sand Co., as their name indicates, is ROCK and only real hard rock equipment can fill their requirements.

Northwest design begins from the bottom up for rock work—cast steel machinery bases and machinery side frames, crawlers that give self-cleaning action and more easily negotiate tough going, the Cushion Clutch that eliminates shock overloads to parts under power, the "Feather-Touch" Clutch Control for easier handling. Uniform Pressure Swing Clutches that take the jerks and grabs out of swinging, the Northwest Dual Independent Crowd that utilizes force most other independent crowd shovels waste—these are but a few of the advantages that Northwest Rock Shovels bring you. And remember, if you have a *real* Rock Shovel you never have to worry about output in *any* digging. With the advantages and proved performance of a Northwest it's no wonder Northwest owners come back!

Above: Model 6 Dragline strips overburden.

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Sauerman News Briefs

SPECIAL EDITION OF SAUERMAN NEWS

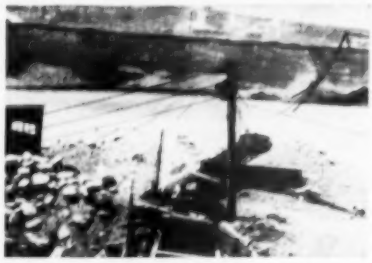
Brief items about the Sauerman Method... Crescent DragScrapers Slackline and Tautline Cableways... Durolite Blocks

Sauerman Bros., Inc. • 630 South 28th Avenue • Bellwood, Illinois, (Chicago Suburb)

4-YARD DRAGSCRAPER ELIMINATES A SHIFT AND UPS PRODUCTION

At the Union Sand and Gravel Co., a Sauerman DragScraper Machine gives Union the production necessary to supply increased plant demand in just one shift. Two shifts were required with their previous installation when a smaller Crescent and hoist were used.

The 4-yd. DragScraper delivers 175-cu. yds. or about 250 tph. when digging 400 ft. from the hopper. Power is supplied by a Sauerman three-drum hoist which has an inhaul speed of 500 fpm. with loaded bucket and a 1,000 fpm. backhaul speed. A 30-ft. tubular steel mast equipped with Durolite blocks forms the head end assembly. Operating cables from the hoist are reeved through the head end Durolites to the rapid-shifting tail bridle system 500 feet away.



A trolley and tail block travel the tail bridle cable. Lateral shifting of the trolley by the third drum changes the Crescent DragScraper's line of operation.

(Condensed from Sauerman News No. 144.)

How MAPCO Digs and Hauls at a Cost of 4 Cents per Ton

Mapco Sand and Gravel Co. is using a 2-yd. DragScraper to work their deposit at a cost of about 4 cents per ton. The company bases this figure on production of 235,000 tons and includes all labor, power, cable replacement and maintenance of hoist and blocks.

The DragScraper Machine is equipped with an electrically operated skid-mounted Sauerman hoist. Power is transmitted by V-belts. This new hoist replaced another Sauerman hoist that was in service for over 25 years.

The Crescent DragScraper works the pit and bank face and delivers to a ground level hopper on an average haul of 450 ft.

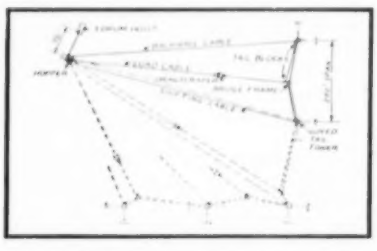
(Condensed from Sauerman News No. 148.)

Enter 1303 on Reader Card

DragScraper Supplies Gravel for 82 Miles of Turnpike

More aggregate production was needed by Southern Michigan Materials, Inc. to supply structural and, upon completion, the maintenance and incidental needs for 82 consecutive miles of the Ohio and Indiana Turnpikes.

This demand was met with a new plant and a 5-yd. DragScraper which supplies gravel at the rate of about 275 tph. Digging goes to a depth of 75 to 80 ft. Power is provided by a Sauerman three-drum hoist driven by a 325-hp. diesel. The rapid-shifting bridle provides a means of changing the DragScraper's line of operation by placing the tail block attached to the bridle in another position along the 250-ft. span between the two steel tail towers.

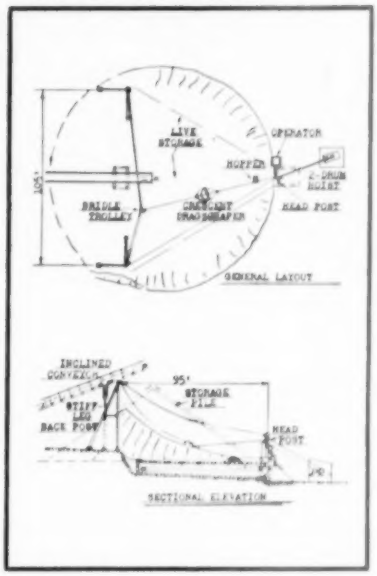


The hoist is pneumatically controlled by the operator from the hoist house. His location gives him excellent visibility of the entire pit and most of the plant.

The parent company, Northwest Materials, Inc., has completely excavated another pit nearby with a Sauerman 2-yd. Slackline Cableway. Northwest also uses a small scraper for stockpiling and reclaiming material from storage.

(Condensed from Sauerman News No. 145.)

Rapid Shifting DragScraper is Engineered to Needs of Silica Sand Producer



The Sauerman Method was successfully applied to the requirements of a prominent silica sand producer, as shown in the drawing above. This Rapid-Shifting DragScraper Machine reclaims raw sand from a 6,000-ton stockpile.

The pile is formed by an inclined conveyor leading from the floor of the quarry to the live storage area. The Crescent DragScraper reclaims from storage to a hopper-fed conveyor in front of the head post.

Before the DragScraper was installed, the raw sand frequently bridged across the hopper. Such interruptions in the flow of raw sand to the plant resulted in costly shutdowns. The Crescent prevents this bridging action and provides a steady flow of material for processing.

The Sauerman Method also permits the company to build up a reserve pile of raw sand sufficient for at least one week's production as insurance against a quarry shutdown.

(Condensed from Sauerman News No. 147.)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 630 S. 28th Ave., Bellwood, Ill.

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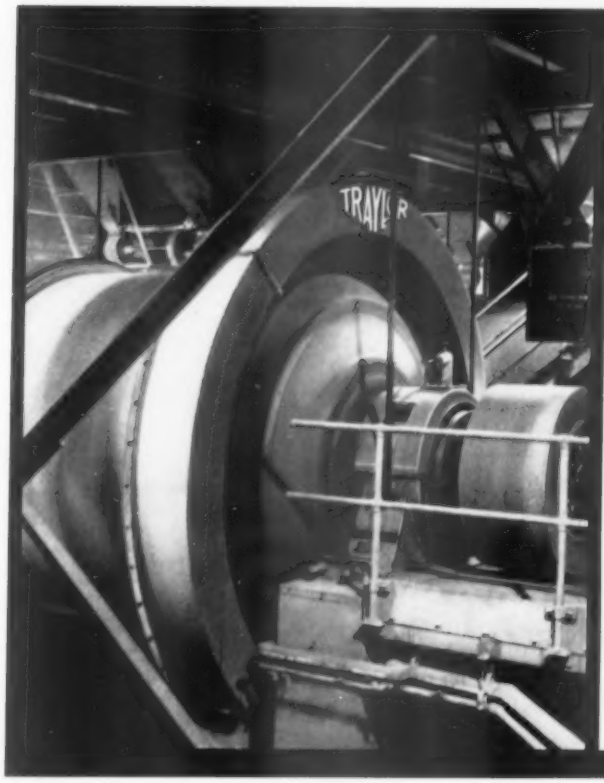

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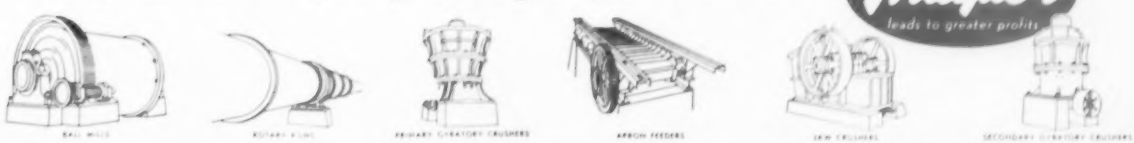

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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

June, 1957

The U. S. Departments of Commerce and Labor announce that expenditures for new construction work put in place during March, 1957, totaled $3.2 billion, a record for the month. It compared with $3.1 billion in March, 1956. Spending for the first quarter of 1957 totaled $9.2 billion, a record for any first quarter, and up four percent from the $8.8 billion spent in the first quarter last year.

A new method of truck-to-train transportation will be placed in operation by New York Central Railroad in about six months. The system incorporates a technique patented by Leo Mellam, president of New York Central Transport Co., a subsidiary. This technique separates the wheel assembly from a loaded highway trailer and places the trailer, without wheels, aboard the railroad flat car. A specially-developed hydraulic lift and turntable on the car pivots the trailer into a parallel position and lowers it to the floor of the car. The whole operation, loading or unloading, takes four minutes.

Geologists, mining engineers and others interested in mineral resources will profit from two U. S. Bureau of Mines libraries containing cores drilled out of the earth by petroleum companies, private mining enterprises and the government over the past several years. The repository in Denver will house cores drilled in the western states and another in Minneapolis will contain cores from the eastern and southern sections of the country. About 700,000 ft. of drilled core are already in storage at the Denver library building, where the staff is cataloging all cores and supplementary technical reports on each one. The library will be like any other reference institution except that the cores cannot be loaned.

Exemption from the Federal excise tax on transportation of property was granted operators of a fleet of dump trucks that hauled gravel and fill on road construction jobs in Wisconsin and Illinois. The gravel was obtained from pits adjacent to the projects and trundled over the roads being improved or constructed. The Tax Court ruled the tax did not apply since the hauling "was an integral part of the construction" of the roads, and that since the payments for such work were "for the improvement of governmental and public highways," they qualified for the exemption granted governmental transportation.

An optimistic outlook for third-quarter sales is shared by business executives, according to a Dun & Bradstreet survey. Those expecting an increase outnumbered those expecting a decrease by five to one. It was the concensus among more than half (54 percent) of the executives that their third-quarter profits would be as high as a year ago, while 36 percent looked for an increase and 10 percent were apprehensive of a decline. The majority saw no change in selling prices for the period as compared with a year ago.

WHAT'S HAPPENING

A "walking" apparatus for machines used in open pit mining, such as power shovels and cranes, has been granted patent 2,785,761. Its German inventor, Anton Becker, assigned rights to Machinenfabrik Buckau R. Wolk Aktiengesellschaft, Grevenbroich. The machine alternately rests on its base and on a set of platforms which serve as its feet. One drawing shows a set of six feet. In taking a step, the machine shifts its weight to its feet, lifts itself just far enough to clear the ground and slides forward. When it sits down and lifts its feet they also slide forward. It can swing its feet around to change direction. Pistons operated by oil pressure are said to make the movement smooth and gradual.

The 150 year old idea of constructing a tunnel under the English Channel has been revived. Estimates of boring a tunnel some 35 miles from near Folkestone to a point near Calais run as high as $280 million. The tunnel is considered the cheapest route for getting British goods to the Continent to compete in the proposed European common market plan.

More federal aid for airports is forthcoming in 1958. Funds provided by the Federal Aid Airport Program amount to $52,265,226. Territories will receive $2,770,000. Adequate local funds to match these federal funds are available or will be provided for construction and improvement of airports at 334 locations.

Heavy construction awards, nationally, totaled $5,587.8 million for the first 16 weeks of 1957, as reported in **Engineering News-Record.** The cumulative total lagged 21 percent below the same period in 1956.

A cement plant for Iceland may soon be a reality. Plans for the plant have been held up because of the country's inflationary economy, but ground has been broken and renewed efforts are being made to raise the funds necessary for construction. Last year the International Cooperation Administration made a loan of $1 million in Danish kroner (receipts from sale of U. S. agricultural surpluses in Denmark) to get construction started, but additional funds are needed. The 70,000 ton per year plant is supposed to be sufficient for the country's needs.

Akron builders are backing the King Bill, which would provide apprenticeship programs for Ohio. The bill would establish a voluntary apprenticeship program and create a nine-member council to administer it. George D. Martter, executive secretary of The Builders Exchange of Akron, said the bill would benefit the building industry tremendously.

Restrictions in the use of cement have been effected in India. The government decided not to import cement during the first six months of 1957 because of the decline in foreign exchange reserves needed for its purchase. There is said to have been a demand for 1,160,000 tons in the last quarter of 1956, but only 558,950 tons could be allocated. A priority basis is being established for users of the material. Steel plants and irrigation and power projects are given highest priority.

THE EDITORS

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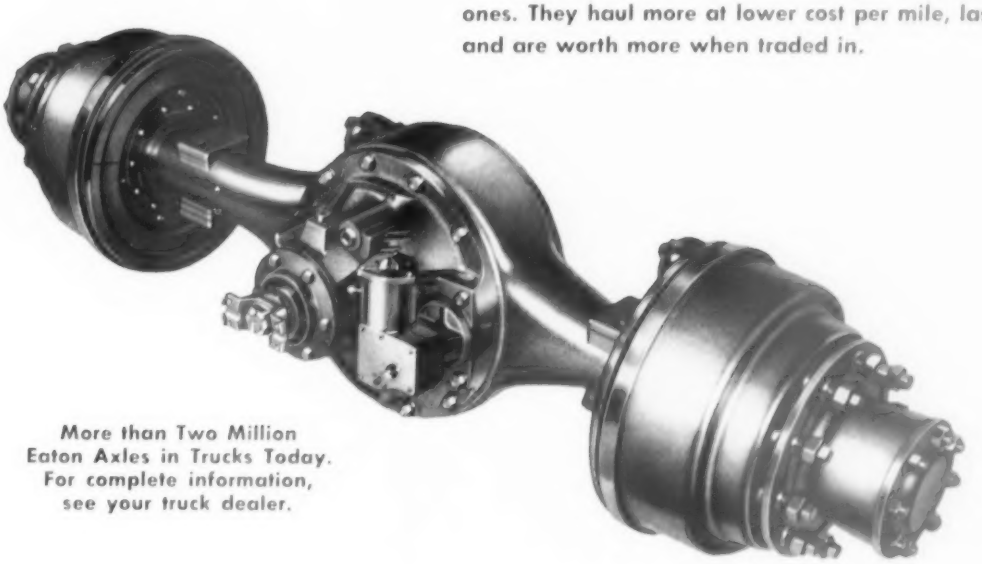

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EDITOR'S PAGE

There's a Switch in Emphasis on Employe Relations

THE SALARIED EMPLOYE—white-collar worker—has entered a new era of importance in the eyes of management. His group now outnumbers the production group (all industry), and he feels that his wants and needs deserve more attention than they've been getting.

Though production people in the nonmetallic mining industry may still outnumber salaried employes (recent data not available), the trend is toward a higher percentage of the latter. That group includes technical and professional, clerical and stenographic, supervisory and administrative, engineering and scientific, sales and research, and staff personnel.

The National Association of Manufacturers began to look into the problem a year and a half ago. Based on findings, it has released a study described as a practical manual "for building better relations with all categories of white-collar people." The study gets to the bottom of the problem and suggests solutions.

Here's the current situation, according to N.A.M. Number of salaried employes is going to grow — as more people get into professional work to keep up with the expanding economy. The group had certain "fringe" advantages over the hourly group in the past, but that's been lost through concessions in labor contracts.

The white-collar worker doesn't ask for too much—only a little more individual recognition, a pat on the back for a good job and a chance to be "in the know" about his company's operations. He's learned, says the report, that placing reliance on management for leadership and job satisfaction hasn't been satisfactory—only in some cases. So he's gone to outside organizations; but that hasn't worked either—yet.

The unions have an eye on this working segment. It's big, and could be a good plum for them if it could be picked. So, there's a contest here —between management and unions—for support of the white-collar worker.

Who'll win? The one that recognizes the real needs and desires of the salaried group and provides the answers that will bring satisfaction. It's not a case of placating stubborn workers but one of securing full and voluntary cooperation of an important group of employes to get the highest returns in morale, skill, effort and performance.

Management thus faces a switch in emphasis on the employe question. And it isn't confined to the big companies. N.A.M. says that more attention paid to uncovering, understanding and correcting causes of dissatisfaction among the salaried group will pay off. They, too, want good supervision, prestige, the chance for growth, security and congenial work environment.

George C. Lindsay

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ROCKY'S NOTES

NATHAN C. ROCKWOOD

A Tribute to a Prince - John Prince

READERS MUST NOT get the idea that this space is to be devoted to eulogies of departed friends. Yet there are a few who left such deep impress that it would be unfair to the industry and to those left not to review some of those characteristics and achievements which left so deep an impress. Younger men now taking over may well be interested in details in the lives of their predecessors which make them remembered and their memories revered—and these are proof of the biblical injunction that "man does not live by bread alone."

Somewhere in our grade school reading lessons there was a poem (we confess we have forgotten title and author) which contained this verse:

"Lives of great men all remind us
We can make our lives sublime
And departing leave behind us
Footprints on the sands of time"

The life of John Prince will ever remind us that all great men—men with great souls—do not necessarily fill positions of great prestige, political or military. A man may show his greatness to a relatively small group, yet those traits of character are just as evident there, as if circumstances had placed him in a position for the whole world to see. Vincent Ahearn in his letter to the members of the Board of Directors of the National Sand and Gravel Association announcing John Prince's death, could not have said a truer and more sincere thing than this: "Those of us who had the high privilege of his friendship will never forget his intellectual vitality and his absorbing interest in his friends and in public affairs."

It has been well said that the most fascinating study for man is the study of man himself. Since no man knows another nearly so well as he knows or should know himself, he can thus learn much. That is, if he is philosopher enough to study himself objectively. Did you, our reader, ever contemplate how very few people there are in this world who can do that? John Prince was one, and he could share his philosophical point of view with his friends.

Some years ago there was a little unconventional group — the "Past-Presidents' Club" — which always had at least one get-together at annual conventions. The qualification for membership was past service as president of the National Sand and Gravel Association. This writer, of course, did not qualify, but he was most fortunate in being an invited guest. There under proper stimulation many an unreported but learned philosophical discussion took place. Those who recall the association presidents of the 1920's and 1930's can well appreciate how and why.

Life's most embarrassing moment. One such a time when newspaper columnists were exploiting the theme of "life's most embarrassing moment," this group got on that subject. John Prince told his, and we retell it because the incident illustrates some of John's character better than merely the usual adjectives and nouns. John did a great many things for his home city (Kansas City, Mo.) in a quiet, diffident and modest but most effective way. This was at a time of considerable race conflict. We in Chicago were very much aware of it for at that time Negroes were being openly beaten and murdered in Chicago streets, and it was equally dangerous for a white man to venture into the South State street Negro belt. To try to avoid such conditions in Kansas City, a civic committee was chosen to meet and promote goodwill between leaders in civic affairs and presumably influential Negroes.

Obviously not an enviable position, John was chosen to be chairman or master of ceremonies. The first difficulty was that no reputable hotel or restaurant with a banquet hall would accept the

Please turn to page 186

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Now—why tie-up useful money or "strap" your credit by "over-equipping"? Why spend upwards of four times as much for several limited-duty machines which one 4-In-1 can replace—and outproduce?

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with "see-easiness" of front-mounting—to grade, strip, spread, or compact with amazing, inch-close accuracy!

Skid-Shovel...

with Drott's exclusive, "concrete-smashing," triple-power pry-action break-out—and 42° ground-level bucket roll-back!

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with clam lip up, and skid shoes on the ground, the radius-controlled blade rolls the earth with precision!

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Exclusive triple-power pry-action break-out

Inbuilt ability to deliver tremendous excavating force enables this TD-9 4-In-1 to yank out deeply embedded old masonry piers. You see typical, on-the-job advantages of true and exclusive International Drott pry-over-shoe break-out action—the only design that gives you the three absolute essentials: (1) Full hydraulic power transfer from full piston-face power-push; (2) Long lever to apply full pry-power; (3) Fixed fulcrum of frame-mounted skid-shoes, to concentrate pry-force!

Exclusive parallelogram raise action

No eccentric tipping to cause spill-back and lose yardage! The 4-In-1 has non-spill, roll-back level—all the way up. Compared to ordinary front-end loader performance, this feature, alone, can increase your daily yardage up to 18%! You can bottom-dump the 4-In-1 as a clamshell...and do it 2½-foot higher than ordinary roll-forward buckets. And bottom dumping eliminates the sticky materials problem—where other rigs foul up and can't get the job done!

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- **STANDARD EQUIPMENT.** Three-valve design, to provide hydraulic control power for attachments.
- **STANDARD EQUIPMENT.** Double-bottom, bridge-truss bucket to insure 4-In-1 strength to match pry-action.
- **STANDARD EQUIPMENT.** Yoke-type supports to insure linkage strength to back 4-In-1 capacity!
- **STANDARD EQUIPMENT.** Magnetized dip stick to prevent damage to hydraulic system from minute abrasives!

Only your International Distributor can offer you the big money-making advantages of International Drott exclusive 4-In-1 features. Only he can deliver you job versatility unlimited, in the world's only multi-purpose machine of its type! Prove to yourself that your correct size of 4-In-1 can replace and outperform a whole machinery yard full of limited-duty rigs. Ask for a demonstration!

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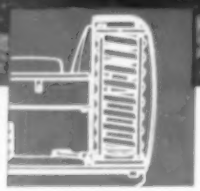

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TD-9	1½-YARD
TD-14	2¼-YARD
TD-18	3-YARD

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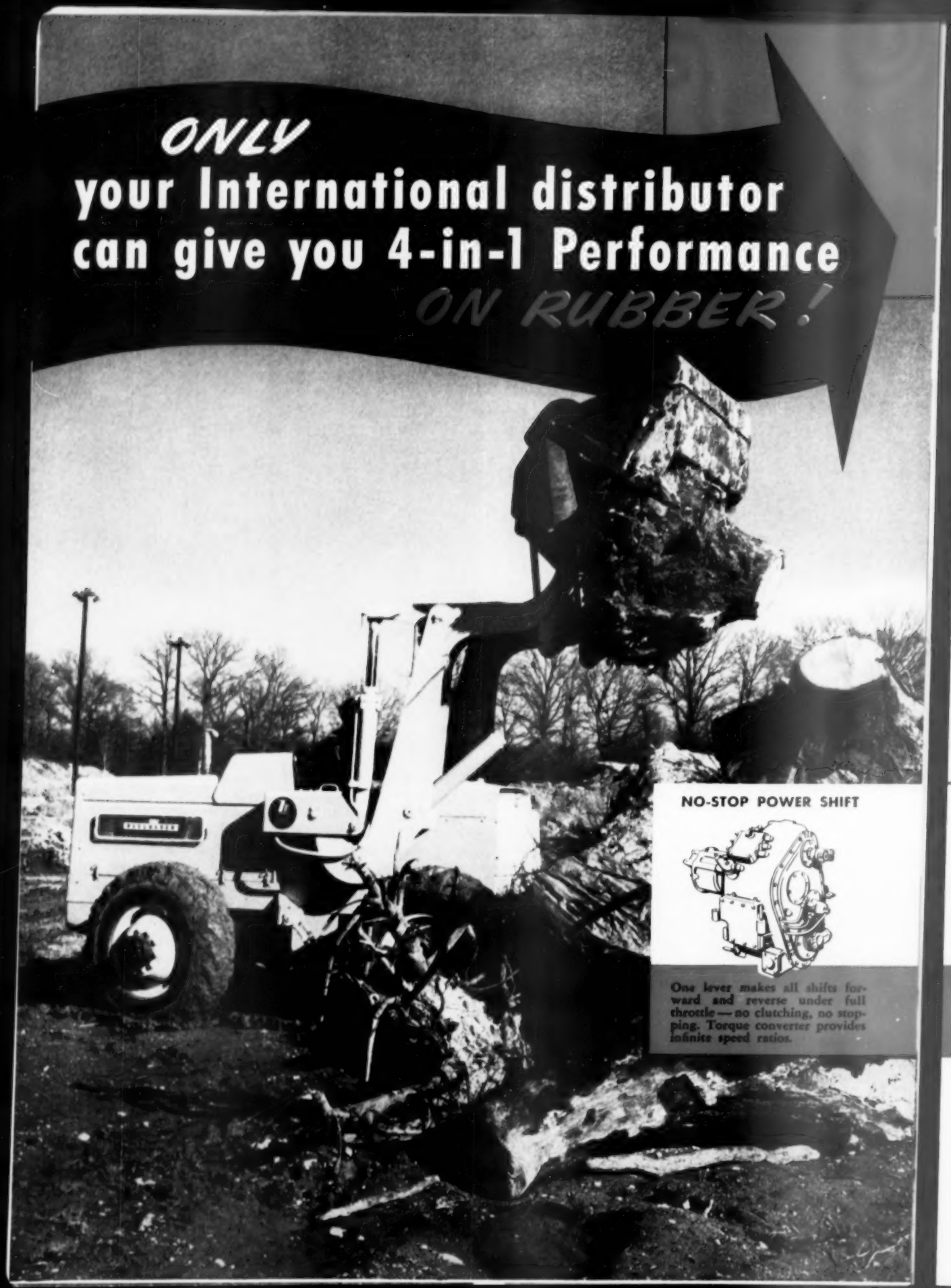
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The only rubber-tired tractor-shovels available with Drott 4-in-1 buckets

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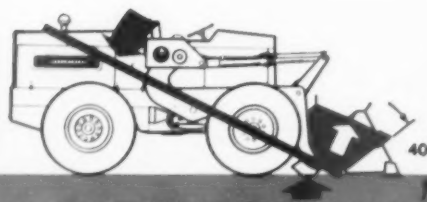
MOBILITY — quick-to-job travel over streets or highways under its own power . . . ability to work on or off paved surfaces.

MANEUVERABILITY — easy operation and fast loading cycles because of responsive rear-wheel power steering, "no-stop" finger-tip power shifting, dependable 4-wheel power brakes.

BALANCE AND STABILITY — long wheelbase . . . hydraulic load-shock-absorber . . . low, close bucket-carry position, all contribute to the easier riding qualities, the higher carrying speeds and the unusual balance that are outstanding "PAYLOADER" operating advantages.

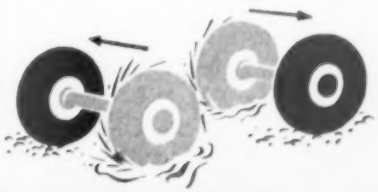
TRACTION AND DIGGING POWER — exclusive power-transfer differentials, planetary final drives and the powerful pry-out bucket digging action help these "PAYLOADER" units to outperform other tractor-shovels of comparable size. Your International Distributor is anxious to demonstrate what these "PAYLOADER" tractor-shovels with a Drott 4-in-1 bucket can do for you. Ask him about the "PAYLOADER" Deferred Payment Plan.

PRY-OUT DIGGING ACTION



Exclusive "PAYLOADER" bucket action combines a powerful prying force over "break-out" pads, with 40° bucket tip-back *at ground level* to get heaped loads into bucket quickly and easily.

POWER-TRANSFER DIFFERENTIALS



These special differentials give better traction under all conditions — automatically deliver 25% more power to the wheels with the better traction.

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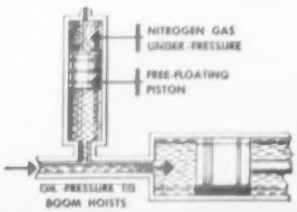

This important device is a part of the hydraulic system. It cushions the loaded bucket, smooths the ride, permits faster carrying speeds, reduces spillage, boosts production.

All three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels, models HU, HH and HO, are available with Drott 4-in-1 buckets, sizes 1, 1½ and 2¼ cu. yd. respectively.

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Three Telsmith 5' x 12' Double Deck Vibro-King Sizing Screens ▼

● In Helena, New York, near Massena, this Lambert-Mills-Gorman plant is supplying aggregate for the Robinson Bay and Grass River Locks. Plant produces about 8,000 to 10,000 tons per day, of four sizes: minus 6" plus 3", minus 3" plus 1½", minus 1½" plus ¼", minus ¼" plus 4 mesh and manufactured sand. Primary crushing is efficiently handled by Telsmith 42 x 48 and 30 x 42 Jaw Crushers. Their product is scalped — plus 6" going to a 16-B Telsmith Gyratory Crusher; and minus 3" to a surge pile, then to three Telsmith double deck Vibro-King Screens.

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Q-35

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Washington Letter

Edgar Poe

Labor A backstage act is taking place on Capitol Hill with some labor-union bigwigs seeking to soften any legislation that might be proposed. Some union leaders privately suggest that Congress start the legislative ball rolling at this session to "democratize" union practices and place union funds under some kind of government supervision.

The pro-unionists feel that, if they can get some moderate legislation passed at this session, it could forestall more stringent measures Congress might pass in 1958.

There's little doubt that the Senate inquiry into "labor and management" abuses will result in some effective restrictions on the bargaining powers of organized labor. At a minimum, the committee, headed by Senator John L. McClellan of Arkansas, will seek to place the powerful international unions under the anti-trust laws that apply to management.

Still another objective will be to put union political activities under decisive legal restraint. Such laws may compare with those that affect political activities of corporations.

The feeling is: some union leaders realize that additional weeks of racketeer-exposing hearings, during this session, would further weaken the unions in the eyes of the general public. Thus, such exposures would have a far-reaching effect on legislation that might be passed next year.

It appears that, growing out of the teamster union hearings into racketeering, legislation to protect union members from autocratic actions by union bosses will be considered. Also considered will be the setting up of safeguards to protect union funds from unauthorized and illegal raids by union bosses. This would include pension and welfare funds.

President Eisenhower wants this type of legislation passed this year. But, some Capitol Hill observers say the chances are good that those conducting the inquiry will "wait until next year" and keep the hearings going for the rest of the session.

There's no doubt that labor unions wield a big influence in Congress, particularly in the House. In a Congressional district a potent labor union in an industrial area can be—many times proves to be—the balance of power. It is harder for the unions to operate so effectively on a statewide basis in senatorial elections. However, any marked curbs on union powers will be controversial.

Mineral Problems President Eisenhower directed a cabinet study of mineral problems late in 1954, to determine what policies should be blueprinted in this field. Later, the chief executive asked the Department of Interior to set up a long-range minerals program within this policy framework. The agency now is conducting a vast amount of necessary research.

Interior spokesman say the research and study has had top priority. Although this hard task hasn't been completed, a program will be sent to Congress in the "near future."

Meantime, assistant secretary of the Interior Felix Edgar Wormser, said that, with the department expanding its fact-finding activities, its mineral agencies will work closely with their counterparts and other interested officials at the "grass roots" level.

Growth of both population and mineral use will continue at rates probably beyond expectations. In the field of nonmetallic minerals, the cabinet official says that the use of construction materials, taken as a group, is growing faster than real income. This use of material has grown more rapidly than the use of lumber, has replaced lumber widely, and is consumed faster than the consumption of metal.

Wormser said research shows that certain minerals, such as gypsum, have grown spectacularly and still promise much growth. Cement, clay, asbestos, lime crushed stone, sand and gravel all

have a much closer relationship to real income in connection with their growth, he said.

Aid To Employers

Vincent P. Ahearn, executive secretary of the National Sand and Gravel Association, with offices in the nation's capital, said that Richard W. Lund, longtime Los Angeles attorney, has come up with a series of effective recommendations to employers for group bargaining with labor unions.

"Unions respect employers," said Mr. Ahearn, "who have the good sense and the good judgment to organize on a sound basis for group bargaining, but contempt for employers . . . who don't have the capacity for sticking together when the situation calls for joint action."

The N.S.G.A. director recommends to employers Attorney Lund's suggestions because of the lawyer's long background and experience with groups bargaining in connection with nonmetallic minerals and ready-mixed concrete. The Lund proposals:

1. Employers associated in group bargaining must make final decisions on principles and policies. They should create a small committee to deal directly with unions in collective bargaining.

2. Employers should not interfere with the committee in executing its responsibility. They should reject any direct approach by a labor union and refer the union representative to the committee.

3. The committee should function the year around. It should have the responsibility for administration and enforcement of the contract and handling all grievances after the initial plant step.

4. Frequent committee meetings should be held to plan the next collective bargaining conference. The committee should watch employer actions that lead to excessive union demands or to avoidable problems.

5. Employers must back their committees with a solid employer front.

6. Employers must accept the reality that the time may come when they have to face up to a strike.

Depletion Allowance

It appears unlikely that bills to repeal or restrict depletion allowance will be considered at this session. The number one target of anti-depletion allowance congressmen is aimed at the 27½ percent allowed oil and gas industry.

However, sand and gravel likely would be affected in some manner in a general revision of depletion allowance laws. Industrial sands receive a 15 percent allowance in credit for income tax purposes in the mining of the product. Construction sand and gravel receive 5 percent tax credit.

Rules on Radio

A complete revision of rules and regulations pertaining to operation of radio by industrial users is pending before the Federal Communications Commission. There is no indication when the commission expects to rule on the plan. A series of petitions have been filed in connection with the proposal.

Among other things the FCC, because of growing demands, would increase substantially the number of radio channels available for industrial users. The "Special Industrial Radio Service," which it is now called, would be replaced by "Business Radio Service."

The projected regulations would remove all existing restrictions on eligibility and use of radio by member companies. If the proposals are adopted, an authorized company could use radio in all of its varied activities as long as they are devoted to business activities.

The Commission said that, on the basis of a study, eligibility of industrial and commercial enterprises can be increased. Reapportionment of frequencies will promote the greatest use of available space.

Government Buildings

General Services Administration, Uncle Sam's "housekeeper," is going ahead with designs and specifications on 98 proposed federal buildings in all parts of the country.

The lease-purchase program, calling for bids, was suspended a few months ago on the ground that the program would further contribute to inflationary conditions. However, GSA said designs and plans for the buildings are continuing so that once the suspension order is lifted, the building program can be resumed. Actual work on less than a half dozen buildings had been started when the order was issued.

Under the lease-purchase program, the post office department and various government agencies that would occupy them would pay for the privately financed buildings like paying rent. Finally, they would own them. Because of the 'tight money' situation, a few of the proposed buildings failed to attract private capital when the government was ready to receive bids. Some critics contend that government failed to offer private capital enough return on the investment.

END

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How would you decide?

A roundup of actual day-to-day in-plant problems and how they were handled by management men

Can you fire a worker for sabotage on circumstantial evidence?

What Happened:

THE CONVEYOR BELT kept breaking down. Each time it was found that a piece of metal had been hung on it. For a long time, the company had no luck tracking down the culprit. Finally, after a breakdown, the repair crew fished up a small U-shaped piece of metal. When the workers were questioned, nobody "knew from nothing." But one employe told his foreman that another worker had told him that he'd seen Jim Bates take a U-shaped piece of metal from a storage bin and put it in his pocket just before the breakdown. The worker who was said to have seen Jim Bates pocket the metal "hemmed and hawed" a lot when asked about it, but finally admitted he *had* seen Bates do it. Bates was fired for sabotage though he denied everything.

The company pointed out:

1. Bates was seen taking that particular piece of metal from a storage bin.
2. The piece of metal could have been put in the conveyor only from the conveyor platform. Bates was on the conveyor platform at the time it must have been done.
3. Bates' denial doesn't mean a thing. He's lied before now for no good reason and has admitted doing so.
4. Although his work has been good, he has a bad record in other respects.

Bates argued from his position that:

1. Nobody claims to have seen me put anything in the conveyor.
2. The guy you say saw me take the metal from the storage bin has told other people he knew nothing about it.
3. All of us go through the storage area to get to the locker-room. It could have been anybody. Why pick on me?

Was the worker:
Right? ☐ **Wrong?** ☐

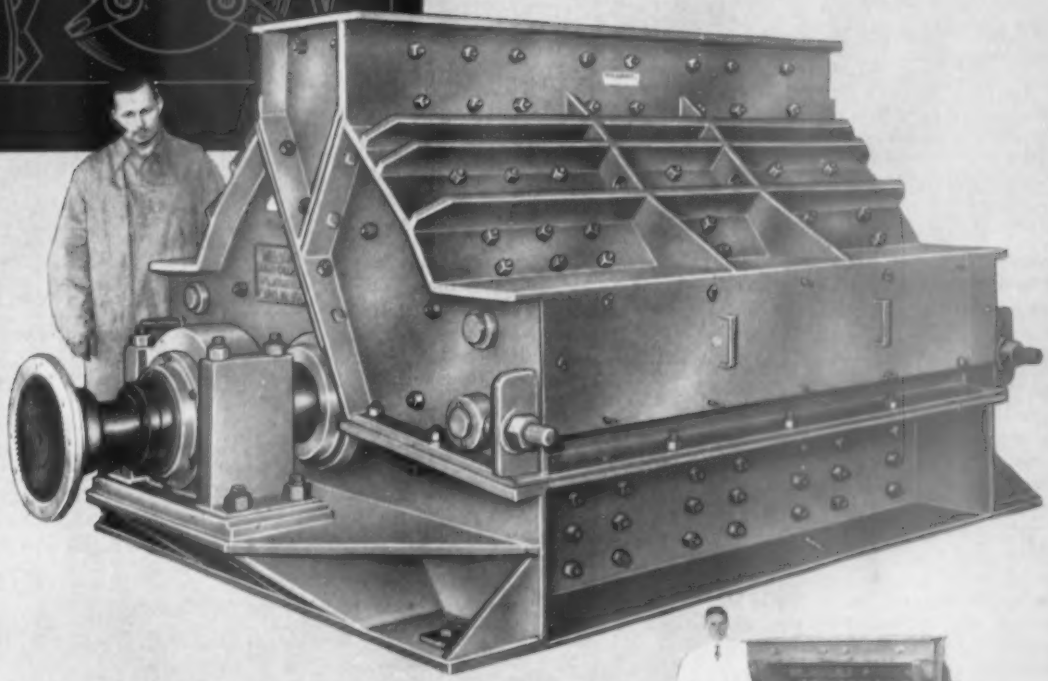
What An Arbitration Board ruled:

"Much of the evidence against the discharge is circumstantial. He admits that he was on the platform at the time the object had to be placed in the conveyor. He also admits being present at work when other instances of sabotage occurred. There is also the testimony of an employe who testified he saw the dischargee take the object from a storage bin. The dischargee denies this and disclaims any knowledge of sabotage. The weight is against the dischargee, for by his own admission he has lied when there was little reason to do so. No challenge of the credibility of the company witness was made. No motive was established that would cause him to lie. The circumstantial evidence and the corroborating testimony indicate the guilt of the dischargee. The Board of Arbitration holds that it was proven beyond reasonable doubt that the dischargee was guilty of sabotage and that his discharge was proper."

(Continued on page 28)

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to *Rock Products*.

WILLIAMS REVERSIBLE IMPACTOR



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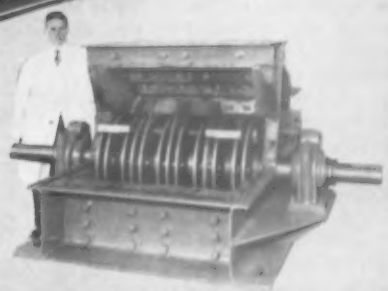

Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

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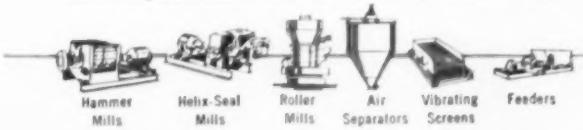

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Continued from page 26

Do you have to give make-up pay to a night-shift worker when he's on jury-duty?

What Happened:

THE CONTRACT said that a worker called for jury duty would get the difference between his regular pay and jury service pay for the hours he had to be away from his work because of jury duty. Frank Logan was on the midnight to 8 a.m. shift. He was called for jury duty beginning at 9 a.m. The days he served on the jury he didn't show up on the night shift. When he asked for the difference in pay, the company refused. Frank insisted he was entitled to it.

The company argued:

1. The time Logan was required to serve on the jury came after his regular work schedule.
2. Since there was no conflict in the time, he didn't have to be away from work. So we're not required to pay him anything.

Logan's argument was:

1. By the time I shower and change and get to the parking lot, it's 8:30. Then I have to drive 11 miles home for breakfast. Then I got to drive 35 miles to the court house. How am I supposed to make it to court by 9 a.m.?
2. When do I get to have some sleep? In court? I can't work all night and be on jury duty all day. Day time jury duty meant I had to be away from my work. I should get paid.

Was the worker:
Right? ☐ Wrong? ☐

What Arbitrator Carl Schedler ruled:

"It seems clear that if the grievant had been working the day shift and was called out on jury duty, he certainly would have lost time from his work schedule. The contract states 'for hours necessary to be away.' Under the facts, was it necessary for the grievant to be away from his work to serve on a jury? We think that it was necessary for him to be away from his work if he was to arrive on time and in proper condition to fulfill his obligation as a juror. We award reimbursement for pay lost under the terms of the agreement."

Can you discipline a worker for being abusive to his foreman?

What Happened:

JIM BOWMAN was not at his work place. His foreman went over to the men's room and yelled, "Bowman, come out of there." Bowman came out promptly. "You've been in there 20 minutes," said the foreman. "You're a liar," said Bowman. "It hasn't been any more than 10." Bowman was fired for being abusive to the foreman. He objected, saying:

1. I was in the men's room less than 10 min. and I've got witnesses to prove it.
2. The foreman cussed me first.
3. Nobody else heard what I said.

The foreman's answer was:

1. How long Bowman actually was in the men's room is beside the point.
2. He was fired for calling me a "liar."
3. Cursing a foreman is cause for discharge, regardless of whether others hear it.

Was the foreman:
Right? ☐ Wrong? ☐

What Arbitrator Paul Hebert ruled:

"The fact that objectionable language was first used by the foreman, coupled with the employe's belief that he was not guilty of taking excessive rest time are facts which should be considered as a substantial mitigation of the proven offense of which the employe was guilty. The employe was clearly at fault in calling the foreman a 'liar.' However, this was not overheard by anyone and it was not in the presence of other employes. Under the circumstances, the conduct, though improper and of a character to justify disciplinary action, cannot be said to justify the supreme economic penalty of discharge. Discharge was an unreasonably severe penalty and, considering the factors in mitigation, cannot be sustained. The employe shall be reinstated with full seniority rights, but without back pay."

END

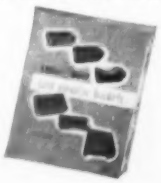
For longer lifting life...

LINK-BELT makes cast elevator buckets for a wide range of materials and capacities

A COMPLETE LINE...	FOR VARIETY OF MATERIALS...	CORRECTLY DESIGNED...	WITH LONG-LIFE FEATURES
 Style AA	Designed for handling coal, grain, chemicals, pulp, and similar materials. Recommended for especially heavy and gritty materials such as sand, gravel and stone.		Style AA cast elevator buckets are made with a wide, thick, reinforced lip for digging and greater resistance to wear and distortion.
 Style AA-RB	Handle same type materials as Style AA buckets. However, these are recommended for extra-heavy service conditions.		Style AA-RB buckets feature double-thick backs for greater strength against bolt pull-through, plus heavy "pick-up contoured" digging lip and reinforced ribs.
 Style B	Commonly used for handling coke, ores, stone, and other coarsely broken materials.		Style B cast elevator buckets offer the proper shape and low front to insure clean discharge at relatively low speeds. Designed for inclined elevators.
 Continuous	Designed for elevating coal, sand, gravel, crushed stone, and similar dry materials.		Continuous cast elevator buckets provide high capacities at low speeds. The flanged front acts as a chute for succeeding bucket—provides clean, gentle discharge.

To obtain better performance, less downtime from your bucket elevators—choose the cast bucket you need from the complete Link-Belt line. They're available in malleable iron or Promal. All have reinforced corners for added strength—are designed for fast filling and quick, clean discharge.

See your nearby Link-Belt office or authorized stock-carrying distributor for facts. Ask for Book 2465.



LINK-BELT

CAST ELEVATOR BUCKETS

14.463

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

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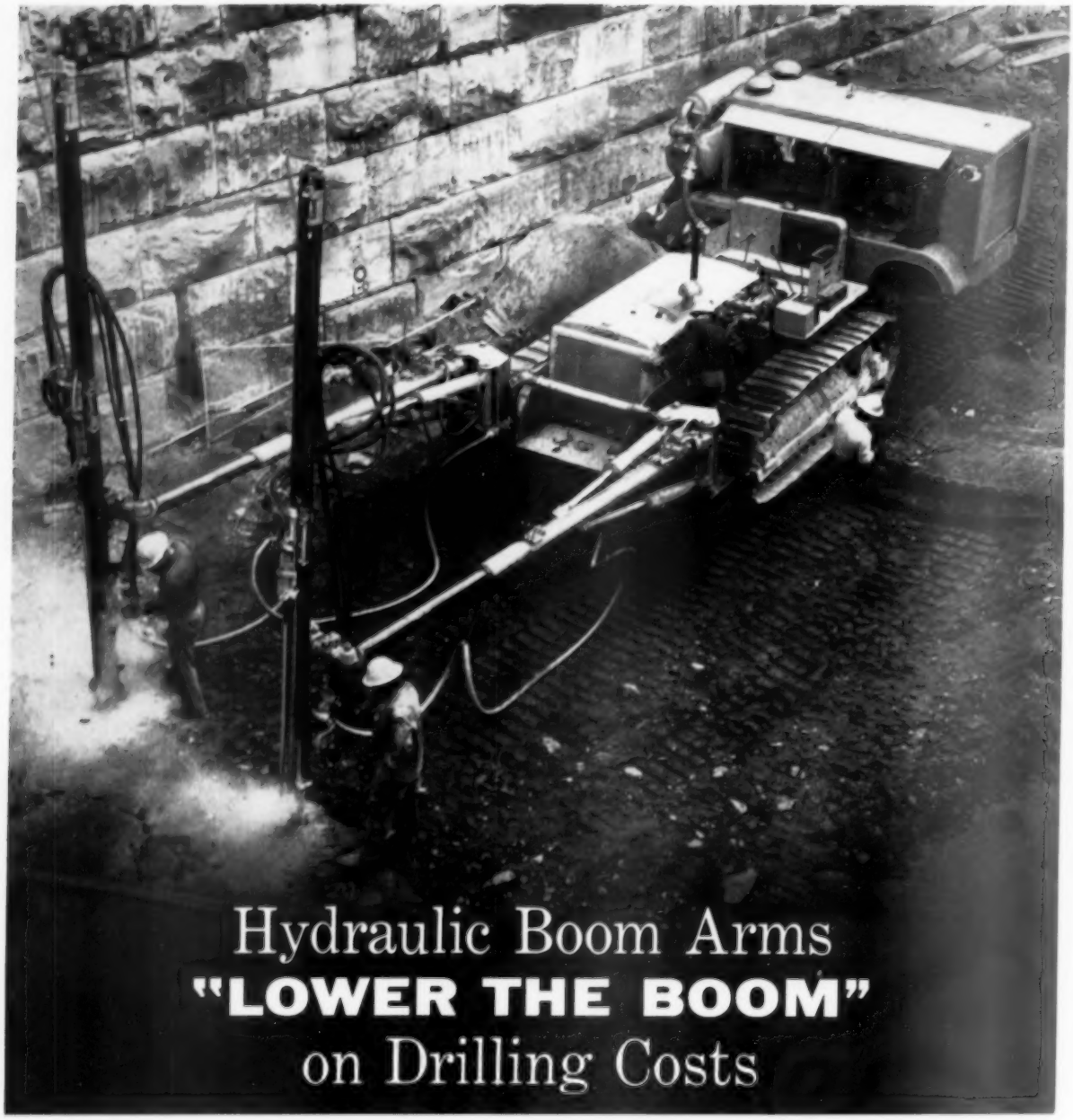

Hydraulic Boom Arms "LOWER THE BOOM" on Drilling Costs

H-Booms have extra-capacity, double-acting hydraulic cylinders that retract and extend, swing or elevate in a hurry—yet pressures are moderately rated. There's no creeping or drifting! Boom can be extended 6 feet . . . that's an extra foot of length to afford better spacing of holes and greater area coverage without moving the rig.

Heavy-duty, Chicago Pneumatic H-Booms can be easily mounted on mine car, track or rubber-tired jumbos. It's a highly productive drilling unit when used on your old tractor. Write for more detailed information. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

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PEOPLE IN THE NEWS

Plant Manager Resigns

WALTER STINSON has resigned as manager of the Sonora, Calif., plant of United States Lime Products Corp., Los Angeles, Calif., to accept a partnership in the Mercer Lime and Stone Co., Branchton, Penn. He had been with the company for 13 years. William McCandlish, engineer, has been appointed acting plant superintendent, and Stanley Wynne, formerly mine foreman, has been promoted to mine superintendent. Mr. McCandlish, a graduate of the University of California College of Mines, has been with the company since last June.

Industrial Relations Director

KENNETH M. FLICKER has been appointed director of industrial relations, North American Cement Corp., New York, N.Y., to succeed Paul M. Hedley, who resigned to become assistant vice-president, community and employe relations, of New York Trap Rock Corp.

Flintkote President

PERCE C. ROWE has been elected president and chief administrative officer of The Flintkote Co., East Rutherford, N.J. Formerly executive vice-president, Mr. Rowe succeeds I. J. Harvey, Jr., who has been named chairman and chief executive officer. Joseph A. Thomas, a director, has been elected chairman of the finance committee, succeeding the late John M. Hancock, and Harry F. Vickers, president and director of the Sperry Rand Corp., has been elected a director of the company. George J. Pecaro, former general vice-president, succeeds Mr. Rowe as executive vice-president.

General Manager

NORMAN HALLIN has been appointed general manager of Saticoy Rock Co., Ventura, Calif., to succeed Lloyd C. Corser, who has retired after 35 years of service, but continues to serve in an advisory capacity. Mr. Hallin was associated with Consolidated Rock Products Co. for six months prior to joining Saticoy Rock Co.

Norman E. Kelb

O. E. Benson

N.C.S.A. Officers Chosen at Convention

NORMAN E. KELB, president of Cumberland Quarries, Inc., and vice-president of St. Paul Quarries, Inc., Indianapolis, Ind., was re-elected president of the National Crushed Stone Association at its recent convention in Miami Beach, Fla. O. E. Benson, president of The General Crushed Stone Co., Easton, Penn., was elected vice-president. Mr. Kelb, with interests in a number of companies, was recently elected president of Ayrshire Collieries, Indianapolis. He has been a director of the firm for six years and succeeds James W. Morgan, who died February 1. Mr. Kelb is also president of the High Point Oil Co., Eel River Mining Co., and is a member of the board of directors of Republic Coal & Coke Co.

Ash Grove Appointments Are Announced

ROBERT M. COX, formerly treasurer and general auditor, has been appointed vice-president of Ash Grove Lime & Portland Cement Co., Kansas City, Mo., according to an announcement by Lawrence Kittle, president. Robert Sunderland has been named treasurer. He was formerly secretary and assistant treasurer. James P. Sunderland has been appointed secretary.

Mr. Cox joined the company in 1927 following graduation from the University of Kansas, Lawrence, Kan. He was made treasurer and general auditor in 1951, and served as safety director for ten years.

Robert Sunderland, a graduate of Washington University, St. Louis, Mo., became associated with Ash Grove in 1949 as an accountant and has also served as credit manager.

James P. Sunderland was formerly associated with the plant at Springfield, Mo. He is a graduate of Washington and Lee University, Lexington, Va., and received his law degree from Washington University, St. Louis, Mo.

Robert and James Sunderland are sons of Paul Sunderland, chairman of the board.

Technical Manager

ROBERT F. MAREK has been named manager of technical and management procurement for International Minerals and Chemical Corp., Chicago, Ill.

(Continued on next page)

PEOPLE IN THE NEWS

(Continued from preceding page)

Administrative Changes

O. J. Glantz

Gayle N. Davis

O. J. GLANTZ, superintendent at the Petoskey, Mich., plant of Penn Dixie Cement Corp., New York, N.Y., has been appointed director of research at Nazareth, Penn. Gayle N. Davis succeeds Mr. Glantz as superintendent at Petoskey.

Mr. Glantz joined the company in 1953 as plant engineer at Clinchfield, Ga., and one year later was named superintendent. In 1956 he was transferred to Petoskey, Mich., as plant superintendent. A graduate of the University of Colorado, Boulder, Colo., with a degree in chemical engineering, Mr. Glantz served with the Bureau of Reclamation, Denver, Colo., as head of the cement unit prior to joining Penn-Dixie.

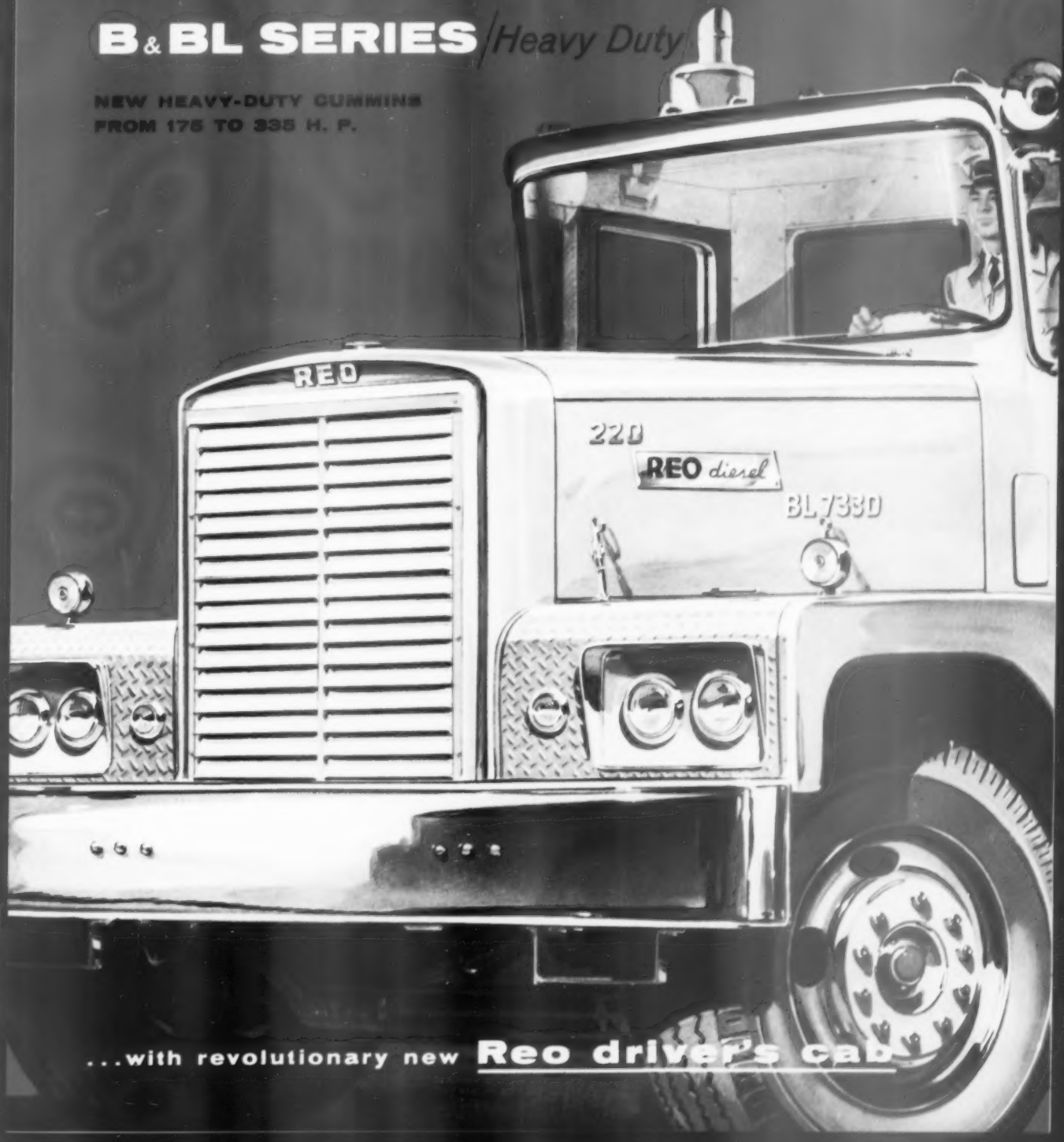
Mr. Davis studied chemical engi-

(Continued on page 37)

NEW REO DIESELS

B & BL SERIES / *Heavy Duty*

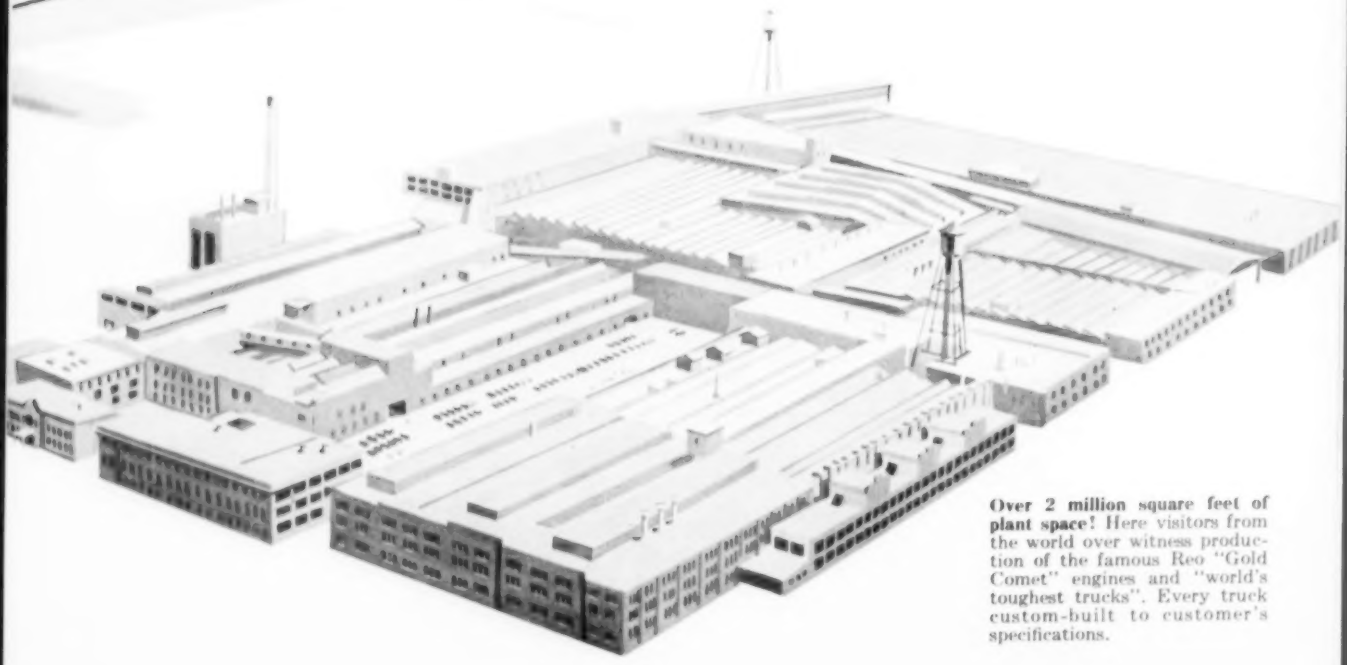
NEW HEAVY-DUTY CUMMINS
FROM 175 TO 335 H. P.



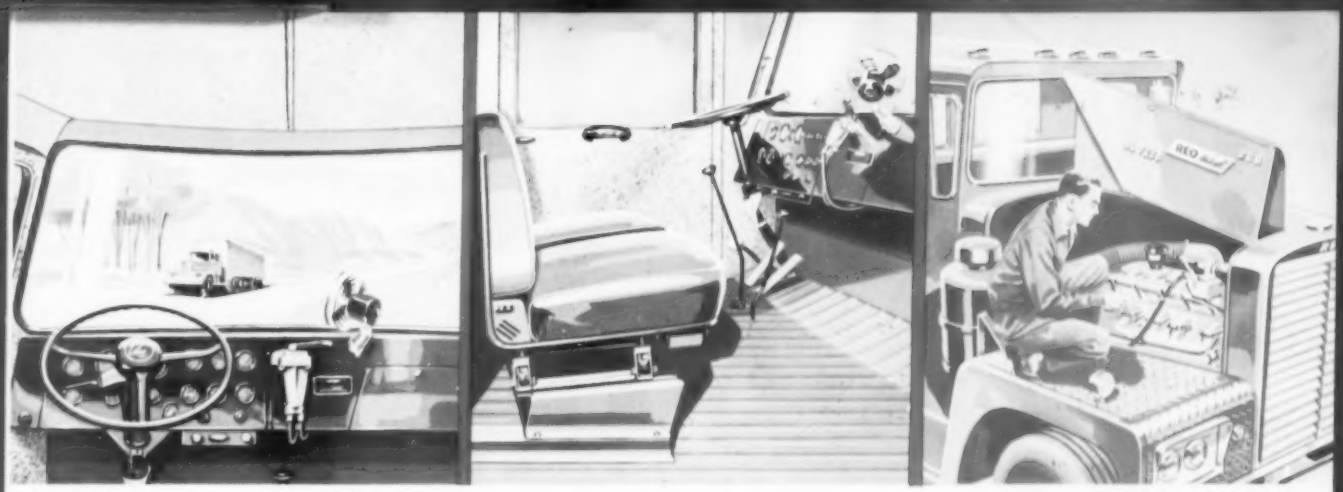
...with revolutionary new Reo drivers cab

New slant-back windshield plus overhang provides double-protection from falling debris, snow and ice.

revolutionary



Over 2 million square feet of plant space! Here visitors from the world over witness production of the famous Reo "Gold Comet" engines and "world's toughest trucks". Every truck custom-built to customer's specifications.



New panoramic vision for driver gives him full sweep ahead and on both sides without glare, distortion or obstruction.

New "living room" comfort for driver. Full leg room. No "dog house". Bostrom "Level Ride 80" driver's seat.

New roominess under hood for ease in servicing engine. Husky "Catwalk" fenders, with "diamond" safety treads.

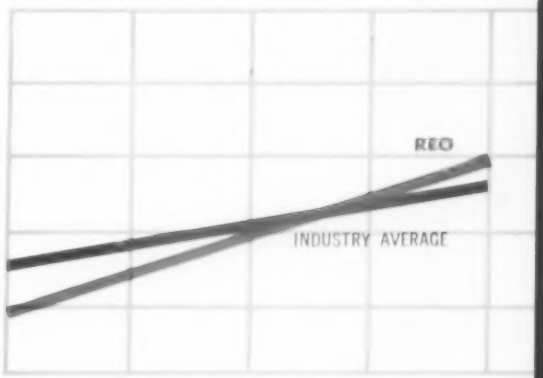
REO DRIVER'S CAB

Reo's New B Series Diesels are brand new. They are the result of extensive research and testing to find the perfect cab for *all drivers* . . . in all operations . . . and under all conditions. They introduce a new concept in driver comfort, convenience and safety—from the Bostrom "Level Ride" seating to the "Panoramic Vision" slopeback windshield . . . from the flat floor and living room spaciousness to the visibility of instruments and convenience of controls.

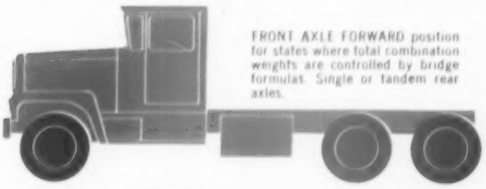
Both four and six wheel tractors and trucks come in all steel or weight reduced aluminum and magnesium. These trucks are especially engineered for economical "Big Load" operations—long-distance highway hauling or tough off-highway service.

Over 8,000 combinations are possible in custom engineering a model to your specific operating requirements . . . using only proven major components from a wide selection.

See your Reo Representative or send convenient coupon today.



Reo sales gain in 26,000 lb. and over GVW class exceeds that of the industry during last 2 years. "Heavy" trend is to Reo.



FRONT AXLE FORWARD position for states where total combination weights are controlled by bridge formulas. Single or tandem rear axles.

FRONT AXLE REAR position for states where maximum front axle loading is desired and bridge formulas are not a factor. Single or tandem rear axles.

REO MOTORS, INC.

LANSING 20, MICHIGAN • TORONTO, ONTARIO

SUBSIDIARY OF **BOHN** ALUMINUM AND BRASS CORPORATION

Please send complete information on following new Reo B Series Diesels. ☐ **Standard** ☐ **Lightweight**

NAME

ADDRESS

CITY STATE

TYPE OF OPERATION

Reo has set the

"GOLD STANDARD OF VALUES"

in truck building since the day of the world-famous Reo Speed Wagon

A WORLD WIDE REPUTATION
FOR LEADERSHIP SINCE 1904

- First to standardize on left-hand drive.
- First single plate disc clutch.
- First center-control gear shift.
- First to standardize on electric lighting and starting.
- First with spiral gears on rear axles.
- First to use lightweight alloy pistons.
- First internal expanding 4-wheel hydraulic brakes.
- First self-shifter . . . forerunner of today's automatic transmission.
- First chrome-nickel alloy cylinder blocks.
- First pneumatic-tired truck.
- First to perfect wet-sleeve gasoline truck engine.
- First heavy-duty V-8 truck engines.
- First factory engineered 6 cyl. and V-8 LP-Gas truck engines
- Only truck manufacturer that backs its complete line of Gas and LP-Gas engines with 100,000 mile warranty.

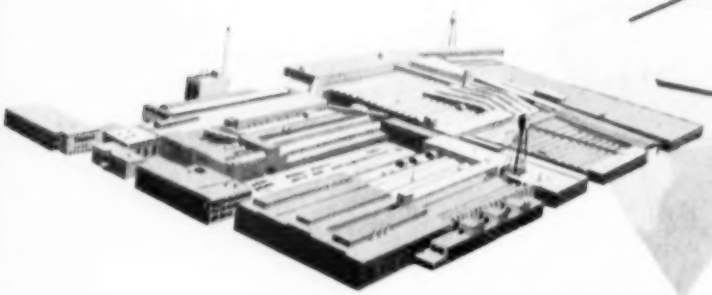
Gold Crown engine built by Reo for its early trucks. Predecessor of Reo Gold Comet.

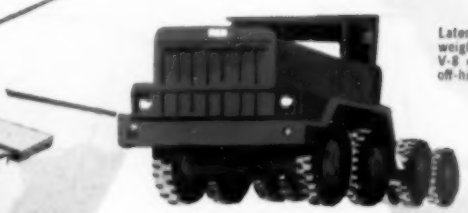
Reo Speed Wagon, introduced in 1915, set new standards in commercial transportation.

Reo Gold Comet "Six" revolutionized the industry with introduction of "wet sleeves".

Reo "Eager Beaver" 2½-ton military vehicle. Over 45,000 produced for the armed forces.

Reo Gold Comet V-8. First heavy-duty V-8 truck engine with modern wet sleeves and short stroke design.





Latest Reo Heavyweight! 470 h.p. twin V-8 engines in 8 x 8 off-highway unit.

REO

BUILDER OF THE "WORLD'S TOUGHEST TRUCKS"

PEOPLE IN THE NEWS

(Continued from page 32)

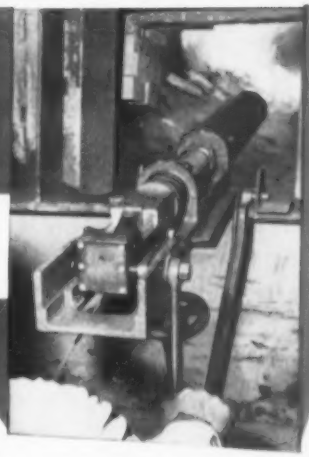
neering at Des Moines University, Des Moines, Iowa. He has had about 33 years of experience in the cement industry and was formerly associated with the Hawkeye Portland Cement Co., Des Moines, for a number of years; Green Bag Cement Division of Pittsburgh Coke and Chemical Co., Pittsburgh, for 17 years, and Ideal Cement Co. as plant manager for the past ten years. He joined Penn Dixie in 1956 as plant engineer at Kingsport, Tenn.

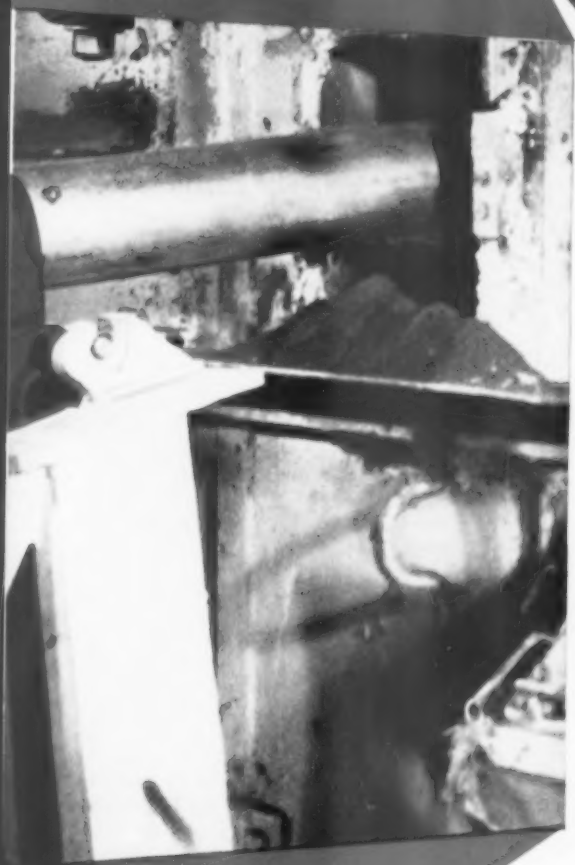
General Manager

LOUIS R. FORBRICH has been appointed general manager of the Green Bag cement division of Pittsburgh Coke and Chemical Co., Pittsburgh, Penn. He joined the company in 1946 as chief chemist and assistant superintendent of the division and has been superintendent since 1950. Prior to joining the company, Mr. Forbrich was director of research and development for The Bessemer Limestone and Cement Co. During World War II he carried out research studies on concrete at Massachusetts Institute of Technology, Cambridge, Mass., for U. S. Maritime Commission projects. He also served in the research and development department of the Master Builders Co. From 1933 to 1938, Mr. Forbrich was a research chemist for the Portland Cement Association, Chicago, Ill., during which time he was awarded a fellowship at M.I.T., where he received an M.S. degree in chemistry and chemical engineering. He also received an M.S. degree from the University of Chicago. Mr. Forbrich is author and co-author of several

(Continued on page 40)

KILN GUN





Ready now—the newest development in Kiln Guns

Ringblaster MK-I, manufactured by Winchester-Western, is new from action to safety! Breaks out clinker rings quicker than ever . . . cuts down-time losses to a new low. The only kiln gun factory-equipped with a muffler—an exclusive feature which reduces operator fatigue.

This gun is the fastest, and safest way to remove clinker rings and other obstructions from rotary kilns.

EXCLUSIVE ***NEW*** MUFFLER*—Compact! Proved in sound tests! Cuts firing noise to an amazingly low level. So compact it won't block kiln doors or impair aim.

NEW **Rapid-Fire Martini action** features short stroke actuating lever. Now you can pump out shots at "pom-pom" speed.

NEW **Barrel is two inches longer,** with a wall 75% thicker. The heaviest and safest barrel mounted on any kiln gun.

NEW Stronger recoil and rebound springs absorb shock better . . . reduce recoil, help maintain bull's-eye accuracy. All recoiling parts are now enclosed for operator protection.

Fire this good-looking kiln gun. Convince yourself of Ringblaster's fast, smooth action. See how much quicker you can pulverize clinker rings . . . and do it safely!

Write for details.

*Patent pending

Ramset*® *Fastening System

WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
12177-F Berea Road • Cleveland 11, Ohio

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PEOPLE IN THE NEWS

(Continued from page 37)

technical papers on cement and concrete. He is a member of the American Society for Testing Material, Committee C-1 on Cement, as well as chairman of the Blended Cement Subcommittee, and a member of the Advisory Committee.

General Crushed Stone Sales Personnel

THOMAS C. FOOTE has been named assistant to the vice-president in charge of sales for The General Crushed Stone Co., Easton, Penn. Wilbur R. Smallwood has been appointed assistant district sales manager to W. H. Litteer in Watertown; Edward D. Barton, assistant district sales manager to Mr. Litteer at Jordanville; and Frederick E. Burnham, assistant district sales manager to J. K. Scott at Rochester. John C. Hayes was recently appointed assistant district sales manager to H. M. VanCleve in Syracuse.

A.I.M.M.E. Speakers

LLOYD A. WILLIAMSON, manager, Cascade Pumice Co., and William E. Miller, president, Central Oregon Pumice Co., both of Bend, Ore., were principal speakers at the recent regional conference in Portland, Ore., of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Kaiser Sales Appointments

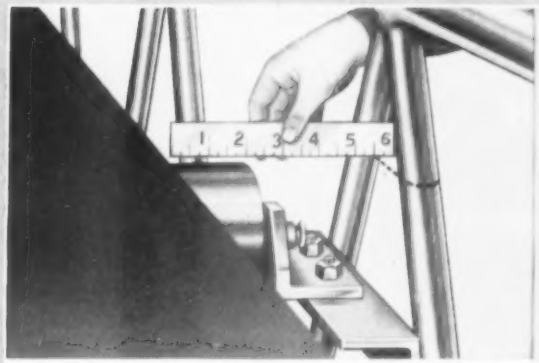
WALTER E. LORD, JR., has been named division manager and Charles E. Watson, gypsum products manager, of the Pacific Northwest sales division of Kaiser Gypsum Co., Inc., Oakland, Calif., covering Washington, Oregon, Idaho, western Montana and Alaska. A graduate of the University of Minnesota, Minneapolis, Minn., Mr. Lord joined the company 11 years ago and has been district sales manager in the Seattle office since 1952. Mr. Watson has been assistant district sales manager for the past 10 months, following four years in the southern California sales office.

Joseph M. Angelo has been promoted to division manager, Sidney J. Smith, gypsum products manager, and Richard C. Crowle, insulating products manager, in northern California, northern Nevada, Utah, Wyoming and Colorado. Mr. Angelo, a graduate of Washington State College, was for-

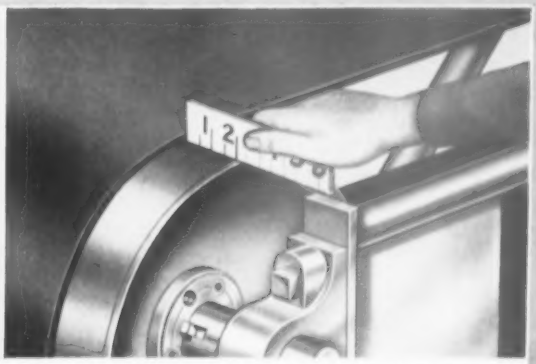
(Continued on page 46)

REDUCE BELT COSTS WITH MARCO TUBULAR FRAME CONVEYORS

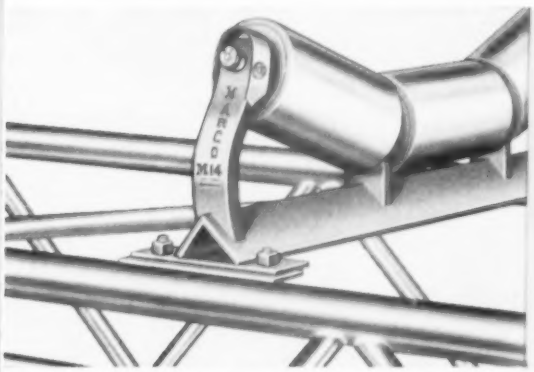
Exclusive conveyor features increase belt life by offering maximum protection against edge damage



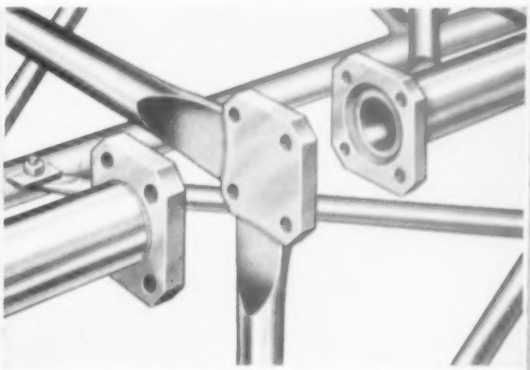
WIDER FRAME—MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area—between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.



WIDER FACE PULLEYS—MARCO is first with modern pulley specifications. 2" between belt and pulley edge—provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.



ALL TUBULAR MEMBERS—MARCO Tubular Frames are more rigid. Constructed of the strongest known structural member, these frames are modern—and resist material and water build-up. Sharp "belt cutting" edges are eliminated with this exclusive construction.



RIGID JOINT CONSTRUCTION—Another MARCO exclusive—4 bolts in each connection—16 in each joint. Not the usual 1 or 2 per connection. Joints are more rigid. Resists frame misalignment, simplifying belt training and increasing belt life.

Now, more than ever, conveyor belt represents the largest major repair or replacement expense in a conveyor installation. Realizing the extreme importance of this fact, MARCO has designed every conceivable belt saving idea into its Tubular Frame Conveyors.

MARCO is first to have all 4 of these proven belt protection features: a wider frame, wider face pulleys, all tubular members and the most rigid joint construction.

If wind, uneven loading, or factors beyond control should cause "belt-wandering", this exclusive conveyor design offers the operator the finest, most complete protection against belt "edge damage".

Increasing belt life by reducing belt "edge damage" is only one of the cost saving advantages in MARCO Tubular Frame Conveyors. Remember, your conveyors are not mere plant accessories—they deserve the attention of a specialized manufacturer offering modern specifications, carefully and properly designed to meet your most exacting requirements. For more information consult your MARCO Distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Missouri.

MARCO*

*Trademark Reg.

engineered MARCO products:

Tubular Frame Belt Conveyors Conveyor Idlers Solid and Self Cleaning Steel Pulleys Bucket Elevators Control Gates Feeders Bins

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United States Steel

new, high-performance Forged Grinding Balls

FREE!

Send for this new, free booklet describing in more detail the characteristics which make these new, high-performance USS Forged Grinding Balls the best value for the money.

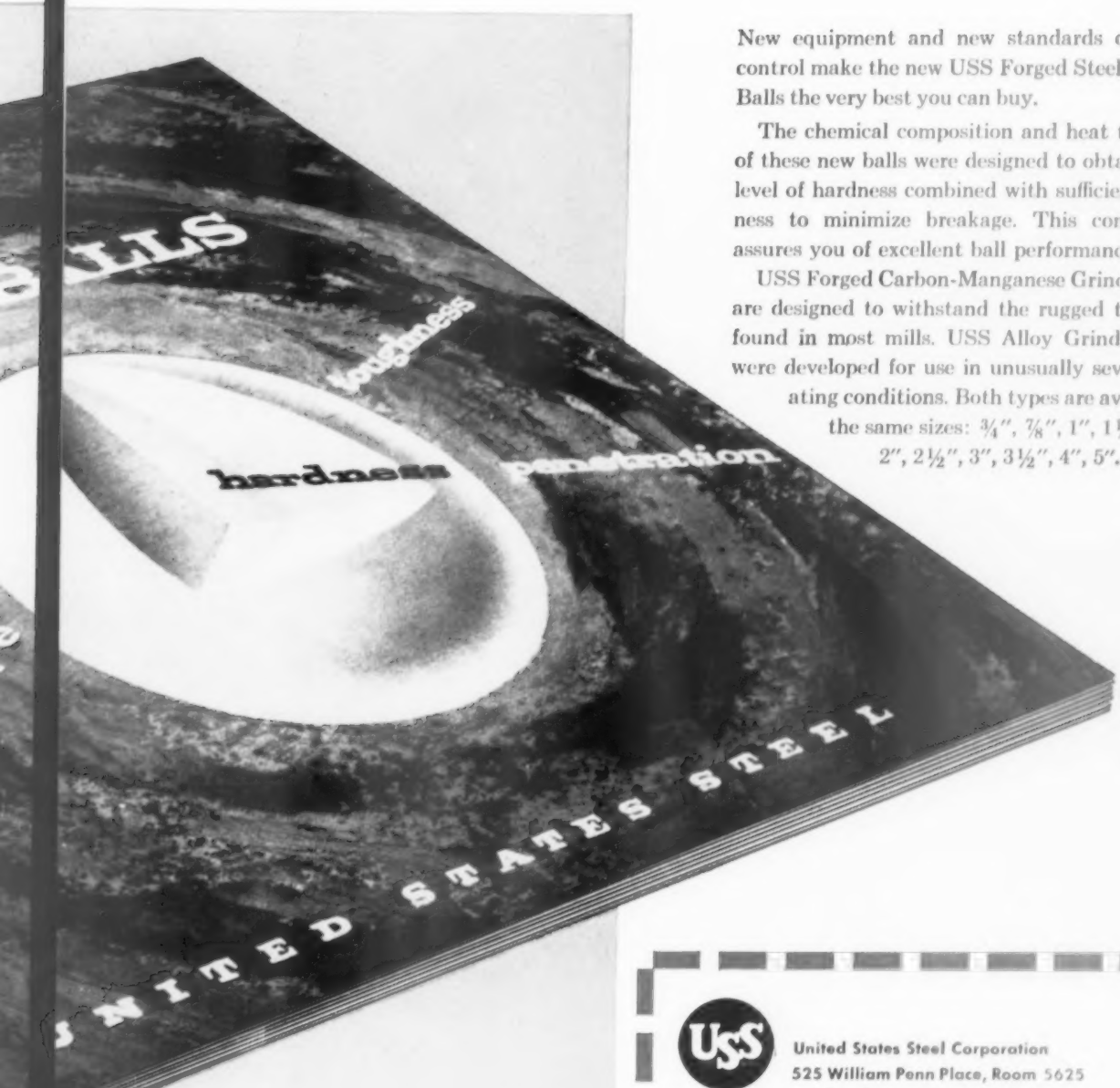
USS Forged Grinding Balls

UNITED STATES STEEL CORPORATION, PITTSBURGH - COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. - UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES

announces

made of either Carbon-Manganese or Alloy Steel



New equipment and new standards of quality control make the new USS Forged Steel Grinding Balls the very best you can buy.

The chemical composition and heat treatment of these new balls were designed to obtain a high level of hardness combined with sufficient toughness to minimize breakage. This combination assures you of excellent ball performance.

USS Forged Carbon-Manganese Grinding Balls are designed to withstand the rugged treatment found in most mills. USS Alloy Grinding Balls were developed for use in unusually severe operating conditions. Both types are available in the same sizes: ¾", ⅞", 1", 1¼", 1½", 2", 2½", 3", 3½", 4", 5".

USS

United States Steel Corporation
525 William Penn Place, Room 5625
Pittsburgh 30, Pennsylvania

Please send me a copy of "USS Forged Grinding Balls."

Name _____

Company _____

Address _____

City _____ State _____

STEEL

At North American Cement Corporation, Howe's Cave, N.Y., this giant Marion power shovel keeps working, with fewer overhauls, on Gulf Dieselect fuel and Gulflube Motor Oil H.D. Chain drives on the shovel are protected by Gulf Paragon. Gulfcrest oil is used to lubricate the air compressors.

North American Cement Corporation gets top equipment performance with Gulf Quality Fuels and Lubricants

To keep equipment operating smoothly and efficiently, North American Cement Corporation depends on Gulf quality fuels and lubricants.

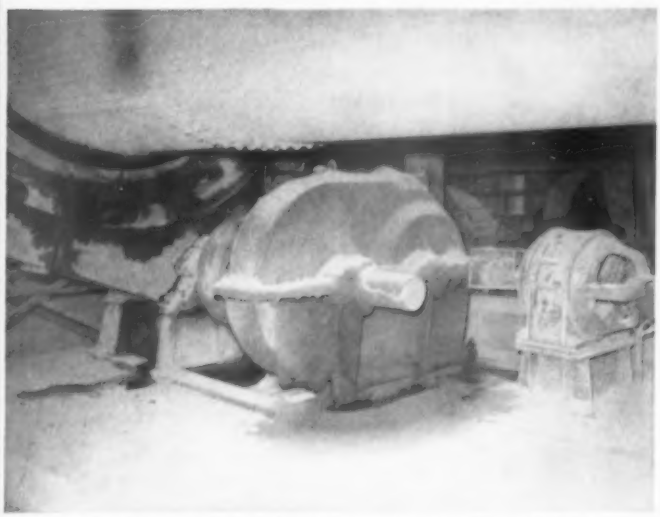
For maximum performance from their power shovels, this firm uses the perfect combination: Gulf Dieselect fuel and Gulflube Motor Oil H.D.

Gulf Dieselect burns clean to cut costly downtime. It reduces valve sticking, helps prevent harmful deposits in fuel systems and injectors. It burns evenly and completely, provides top engine performance.

Gulflube H.D. provides superior lubrication. It keeps rings clean and free . . . aids in getting better compression . . . lasts longer and cuts maintenance costs.

North American Cement Corporation also uses Gulf Lubcote on open spur gears, Gulf Paragon on chain drives, Gulflex A on pressure bearing fittings, Gulf E.P. 95 on eccentric drive shafts on their crushers.

Are you entirely satisfied with the performance of *your* equipment . . . and expense for maintenance? Call the Gulf Sales Engineer for practical help. He's at your nearest Gulf office.



Reduction gears for rotary kilns are protected with Gulf Harmony 97. Gulf quality fuels and lubricants mean fewer mechanical delays, lower maintenance costs.

GULF OIL CORPORATION
1822 Gulf Building, Pittsburgh 30, Pa.

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

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PEOPLE IN THE NEWS

(Continued from page 45)

merly district sales manager in northern California, and has been with the company for six years. Mr. Smith joined Kaiser Gypsum in 1947 and until recently served as assistant district sales manager of the northern California sales district. Mr. Crowle also joined the firm in 1947, serving in sales and as administrative assistant to the vice-president and general manager. He was recently appointed sales manager.

James J. Hague, formerly southern California district sales manager, has been named division manager in southern California, southern Nevada, Arizona, New Mexico and Texas. Hugh Ferguson, assistant district sales manager, and Walter T. Smith, special salesman, have been named gypsum product manager, and Galen M. Thomas becomes insulating board products manager. A gypsum sales representative for more than five years, Mr. Thomas returns to Kaiser Gypsum after four years as a contract sales manager for Kaiser Metal Products, Bristol, Penn.

General Manager

ROBERT H. ALLEN has been appointed general manager of Presque Isle Corp., Cleveland, Ohio. A native of Saginaw, Mich., and a graduate of the Michigan College of Mining and Technology, Houghton, Mich., Mr. Allen formerly served as quarry superintendent at the National City, Mich., plant of National Gypsum Co., Buffalo, N.Y. Previously he was plant engineer at the Alabaster, Mich., plant of United States Gypsum Company, Chicago, Ill.

Named Superintendent

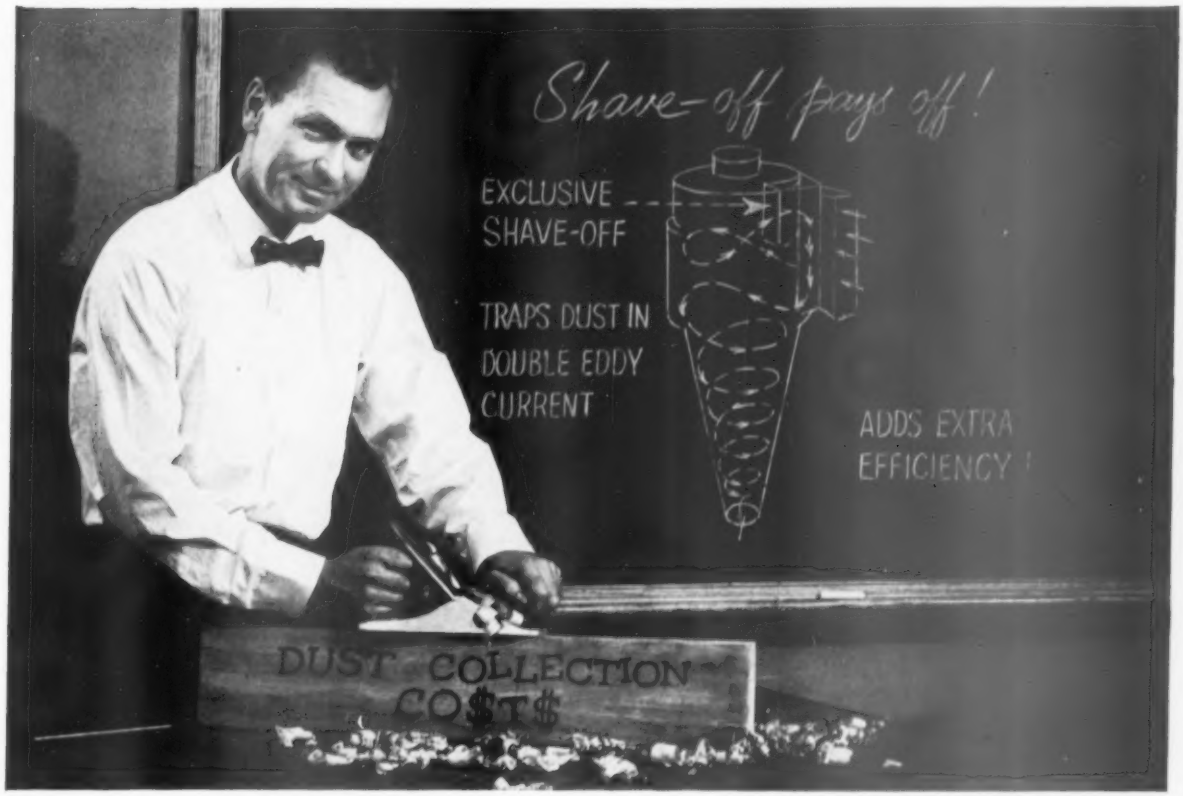
CLARENCE A. GUSTAFSON has been named superintendent of the Bowmansville, N.Y., plant of the Buffalo Crushed Stone Corp., Buffalo, N.Y. He was formerly associated with Sussex Quarries, Inc., Hamburg, N.J.

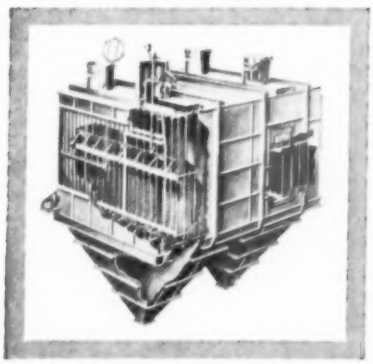
Calaveras Sales Managers

WILLIAM G. JEFFREY has been appointed sales manager of Calaveras Cement Co., San Francisco, Calif. He joined the company in 1949 and has been manager of dealer sales since 1954. James Casey, formerly supervisor of contractor salesmen, and Jack Gordon, formerly contractor sales representative in Oakland, have been named regional division managers.

(Continued on page 49)

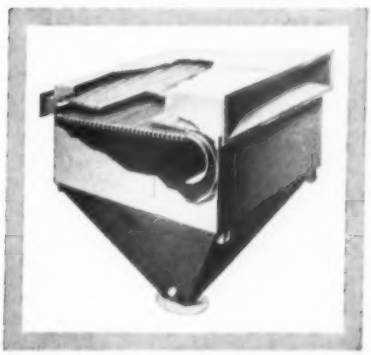
How Buell's exclusive Shave-off pays off in extra dust collection efficiency





Buell SF Electric Precipitator also delivers extra dust collection efficiency, due to unique Spiralectrodes and Continuous Cycle Rapping.

Proper proportioning, side entry of dust-laden gases, add even more extra efficiency and long, maintenance-free life to Buell Cyclones. Large diameter design eliminates bridging and clogging, keeps efficiency high under varying loads.



Buell Low Resistance Fly Ash Collector combines top efficiency with low draft loss, for either natural or mechanical draft installations.

For more specific data about Buell's *extra efficiency*, write Dept. 16-F, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

buell

MECHANICAL ELECTRICAL *Experts at delivering Extra Efficiency in* **DUST COLLECTION SYSTEMS**

Enter 1280 on Reader Card

PRODUCT VERSATILITY WITH EAGLE

Washing-Classifying-Dehydrating Equipment

AT GENERAL MATERIALS DIVISION OF NEW YORK COAL CO., SPRINGFIELD, OHIO

The diversified activities of New York Coal Co. include the modern aggregate plant of their General Materials Division near Springfield, Ohio. This compact, versatile plant can produce a variety material gradations to exact specification.

A Complete Washing-Classifying-Dehydrating Section consisting of a 16 ft. Water Scalping-Classifying Tank with Power-Operated Bleeder Valves and 3-Cell Collecting-Blending Flume and a 36" dia. x 22' Single Screw Washer-Classifier-Dehydrator handles fine material processing.

At a secondary station coarse material is processed by a 36" dia. x 18' Eagle Coarse Material Washer-Dewaterer.

Here is a profitable combination of Eagle Equipment that gives this producer—and their customers—just the material they want. You, too, will find that you can't beat Eagle Equipment for economy, low maintenance cost, service and most important—*profit!* You'll stay ahead with Eagle Aggregate Processing Equipment. Send for Catalog.

1872 85th anniversary 1957

EXPERIENCE, PROGRESS, SERVICE, SINCE 1872

EAGLE IRON WORKS

137 HOLCOMB AVE., DES MOINES, IOWA

FINE MATERIAL WASHERS

WATER SCALPING—CLASSIFYING TANKS

COARSE MATERIAL WASHERS

LOG WASHERS

"SWINTEK" DREDGE LADDERS

COMPLETE DREDGES

BREAKER BALLS & PILE HAMMERS

Enter 1295 on Reader Card

PEOPLE IN THE NEWS

(Continued from page 46)

Fill Sales Posts

Edward A. Weymouth

Lewis J. Patterson

EDWARD A. WEYMOUTH has been appointed manager of sales for the Michigan Limestone Division, Detroit, Mich., of U. S. Steel Corp., Cleveland, Ohio. He assumes responsibilities in this area previously held by J. A. Valentin, vice-president of the division. Lewis J. Patterson has been named manager of the northern district of the division, succeeding Mr. Valentin.

Mr. Weymouth joined U. S. Steel in 1939 as a sales engineer with Pittsburgh Limestone Corp. He is a member of the American Concrete Institute and also of the American Society for Testing Materials.

Mr. Patterson was employed at the Calcite plant of Michigan Limestone and Chemical Co., Rogers City, Mich., as an engineer in 1940. In 1951 he was named assistant manager of the plant, and two years later was appointed operating manager. In 1955 he was promoted to manager of the Calcite plant and assistant manager of northern district stone production.

(Continued on page 55)

New A-Line models range from ½-ton Pickups through 33,000 lbs. GVW Six-Wheelers.

NEW ACTION-STYLING! MORE USABLE POWER!

Here is the crowning achievement of fifty years of quality truck production—the great new Golden Anniversary INTERNATIONAL Trucks!

They're *Action-Styled* with fresh, clean functional lines that set a new style pace.

They're powered by new engines that put out more *usable* horsepower—including the most powerful "six" available in its field! They have exclusive new cab mountings for quieter, more level ride. New brakes, new steering, new frames—and many other new features.

The result is a new line of trucks that—more than ever before—are built to cost *least* to own!

See and drive these newest INTERNATIONALS *today!* International Harvester Company, Chicago.

Trucks Unlimited... Powered for Modern Traffic... Plus Modern Comfort

Handsome "Golden Jubilee" Pickup with the *longest* all-steel body in its class. Only Panel with third door. New 8-passenger Travelall® models. New cab-forward models with ideal 89-inch BC dimension. Tractors to 48,000 lbs. GCW. Wide range of all-wheel-drive trucks.

Redesigned engines produce *increased* power without strain from new combustion chamber and valve position . . . more usable power that's "bred for the job". . . at low rpm to keep operating and maintenance costs low. New quick-starting 12-volt ignition.

Biggest windshield—1,181 sq. in.—and *widest* cab in their class! New "Silent-Vent" door wings. New, wider front and rear springs. Exclusive level-riding 5-point cab mounting. Bigger brakes with more lining area, larger cylinders and boosters for quicker, easier stops.

Other INTERNATIONALS, to 96,000 lbs. GVW, round out the world's most complete line.

NEW Golden Anniversary INTERNATIONALS

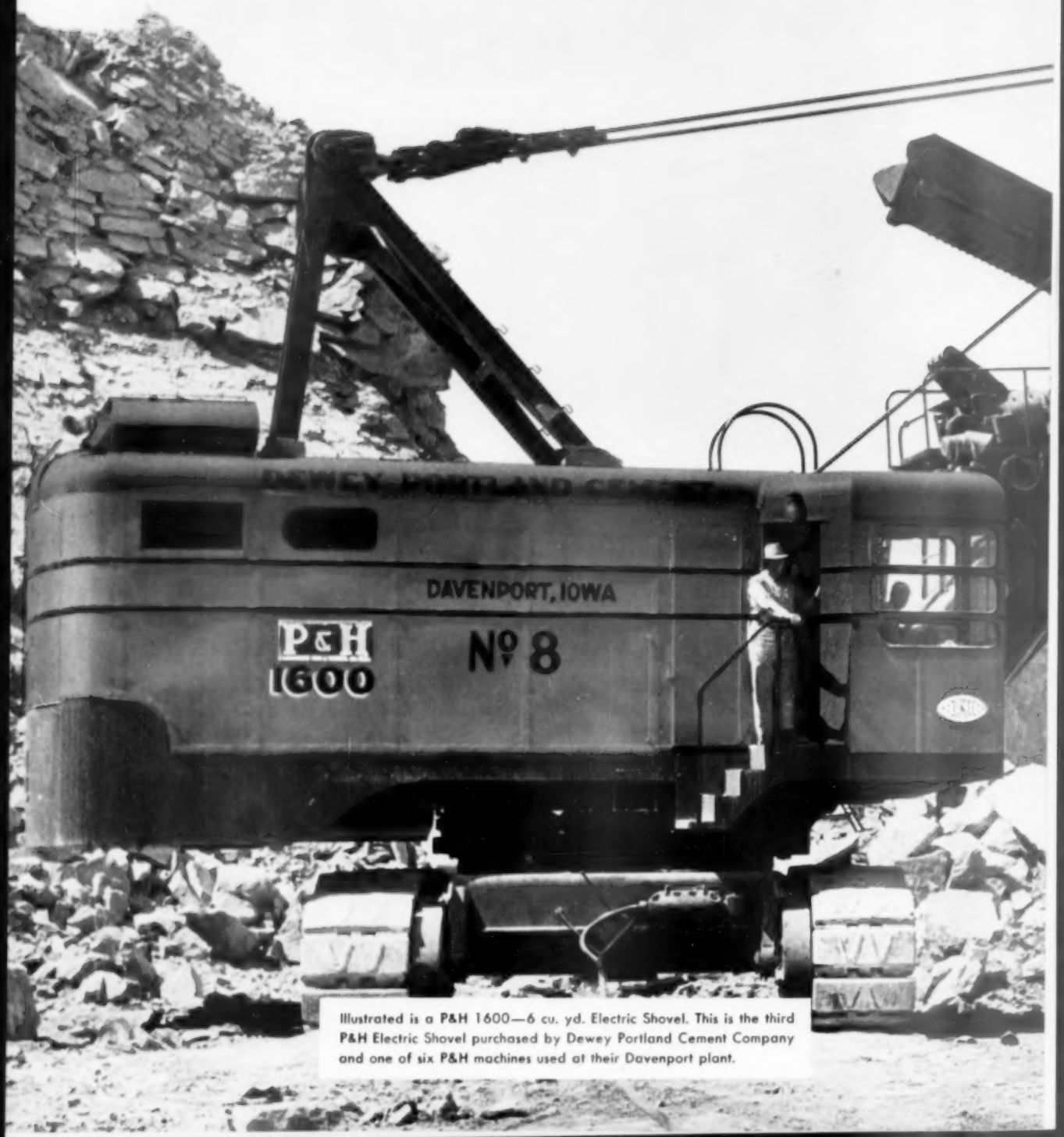
Cost least to own!

50 YEARS of TRUCK QUALITY 1907 1957 INTERNATIONAL TRUCKS

Motor Trucks • Crawler Tractors • Construction Equipment
McCormick® Farm Equipment and Farmall® Tractors

Enter 1308 on Reader Card

P&H Electric Shovels



Illustrated is a P&H 1600—6 cu. yd. Electric Shovel. This is the third P&H Electric Shovel purchased by Dewey Portland Cement Company and one of six P&H machines used at their Davenport plant.

give you 95% Availability

Reports of 95% availability by users of P&H Electric Shovels are not at all unusual. This typically outstanding P&H performance is the result of these exclusive P&H designed and manufactured features!

MAGNETORQUE* . . . transmits power from the hoist motor to the dipper magnetically for faster action, and at the same time, eliminates shock and impact to the hoist gear train and motor. Response is immediate to varying load conditions.

ELECTRONIC CONTROLS . . . P&H designed and built to provide fastest action of any type of control available on electric shovels. All motions are smoother, resulting in consistently higher output.

P&H Basic Design . . . permits scientific weight distribution to insure maximum stability with higher bail pull. All-welded construction adds ruggedness and stability needed for the toughest jobs.

With P&H you get all of these exclusive electric shovel features . . . plus the advantage of single source responsibility. P&H designs, manufactures and applies all electric rotating equipment specifically for electric shovel service.

P&H ELECTRIC SHOVEL LINE: 3½ through 8 cu. yd. capacities.

HARNISCHFEGER

CONSTRUCTION & MINING DIVISION

Milwaukee 46, Wisconsin

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

Lima Type 1201 dragline equipped with an 85-ft. boom, dredging channel into Biscayne Bay at Ojus, Fla. Approximately 250,000 cu. yds. of sand and coral rock will be moved to complete this job.

LIMA dragline speeds dredging operation in Florida

This big Lima Type 1201, owned by L. C. Morris, Inc., of Miami, Fla., is making quick work of dredging a channel into Biscayne Bay. Day in and day out, their Lima takes fast, steady bites of sand and coral rock. It's the built-in quality extras—such as piston-ring-type dirt seals and retainers in crawler rollers . . . flame or induction-hardened moving parts for longer life . . . properly balanced weight for maximum efficiency . . . anti-friction bearings at all important points . . . oversize drums and sheaves for long cable life . . . and extra-wide, extra-long crawlers for greater stability—that result in big production with minimum repair and maintenance.

It will pay you to get the full story on Limas from your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

COMPARE OTHERS WITH LIMA FOR QUALITY AND YOU WILL SPECIFY LIMA

Shovels . . . ½ to 6 cu. yds.
Cranes . . . to 110 tons
Draglines . . . variable
Smaller capacity models available on rubber

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS
BALDWIN - LIMA - HAMILTON
Construction Equipment Division — LIMA WORKS

PEOPLE IN THE NEWS

(Continued from page 49)

North American President

PERRY W. ANDREAS, executive vice-president, has been elected president of North American Cement Corp., New York, N.Y., to succeed Albert M. Andreas, who continues as chairman of the board.

Ideal Re-elects Directors

ALL DIRECTORS of Ideal Cement Co., Denver, Colo., were re-elected at a recent meeting of the stockholders. They include C. K. Boettcher, chairman of the board; Charles Boettcher II; Cris Dobbins, president; C. B. Flick, treasurer; A. E. Humphreys; M. O. Matthews, executive vice-president and Henry C. Schaack, all of Denver; Benjamin R. Boutell, Bay City, Mich.; J. H. Colton, Reno, Nev.; Adolph Coors, Golden, Colo.; D. J. McGanney and Marshall P. Madison, San Francisco and Norman G. Nicholson, Mobile, Ala.

Sales Representative

GEORGE WESLEY JONES, JR., has joined Southern Lightweight Aggregate Corp., Richmond, Va., as sales representative for western Virginia and western North Carolina. He formerly served with the Virginia State Health Department as administrative assistant to the director of tuberculosis control.

OBITUARIES

Alvin E. Crumm, superintendent of the Chico, Texas, plant of Southwest Stone Co., Dallas, Texas, for the past 20 years, died March 16 following a short illness. He was 69 years of age. Before moving to Texas in 1937, Mr. Crumm was associated with the France Stone Co., Toledo, Ohio, for 24 years.

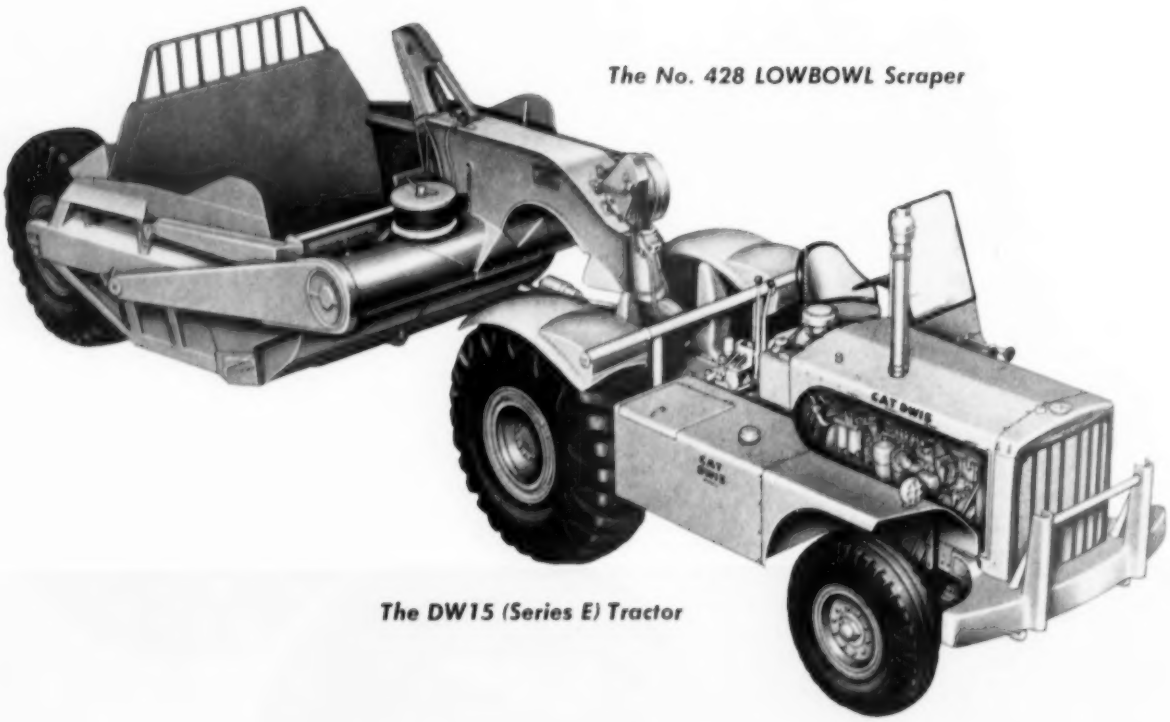
Erratum

In the obituary item on John F. Keefner in the January issue of ROCK PRODUCTS, we erroneously stated that he was the owner of the Keefner Sand & Gravel Co. Mr. Keefner was president of the Keefner Concrete & Lumber Co., which was sold to the J. C. White Concrete Co. in 1945, at which time he retired. His son, Joseph Keefner, is president of the Keefner Sand & Gravel Co. and has been for a number of years.

END

CATERPILLAR ANNOUNCES

NEW DW15 (SERIES E) AND NEW No. 428 LOWBOWL SCRAPER



The No. 428 LOWBOWL Scraper

The DW15 (Series E) Tractor

Here's a new Cat team loaded with features that add up to one thing—A HIGHER PRODUCTION RETURN ON YOUR INVESTMENT. See your Caterpillar Dealer for details on this great team's performance.

GET THE STORY IN BRIEF ON THE OPPOSITE PAGE

A GREAT TEAM: The performance of the DW15 (Series E) Tractor and No. 428 Scraper can be summed up simply: bigger loads—faster.

FACTS ABOUT THE DW15 (SERIES E) TRACTOR

Around the world, the DW15 has proved that it can move material faster and more profitably than competitive machines in its class. Now there's a new DW15 (Series E) to give you even higher production. This is the story:

ENGINE: A new Caterpillar D326 Engine, designed especially for the DW15 (Series E), develops 200 HP (maximum output capacity).

And Caterpillar research has produced a 23% torque rise in this new engine! This means that high tractor rimpull is maintained through a wide range of travel speeds in each gear, and the need for gear changing is decreased. In fourth gear, for example, over 3,000 pounds of rimpull are delivered at travel speeds from 9 MPH all the way to 18 MPH. A new engine, yes—but with these traditional Caterpillar advantages: uses inexpensive No. 2 furnace oil without fouling; needs no fuel system adjustments; requires no cleaning of fuel injection valves.

TRAVEL SPEED: The DW15 (Series E) offers ten speed selections, from 2.7 to 37.2 MPH. But, more important, it provides four-wheeled sure-footedness—*the ability to use the speed on the job.* Operators ride with more comfort, feel greater stability. They travel faster, and in safety.

MANEUVERABILITY: Four-wheeled stability means faster cycle time because the DW15 (Series E) can make short radius turns at higher speeds. It can turn without stopping inside a 35-foot diameter and in a smaller area through use of a turn-back-turn maneuver.

VERSATILITY: The DW15 (Series E) provides versatility that far surpasses similar sized two-wheeled machines. It can be unhitched from its scraper and used as an independent unit to tow compactors, water wagons or other units, and it can be teamed with the Athey PR15 Wagon for rock hauling work.

FACTS ABOUT THE No. 428 LOWBOWL SCRAPER

CAPACITY: Struck—13 cu. yd.; heaped—18 cu. yd.

ADVANCED DESIGN: There is more to Caterpillar's exclusive LOWBOWL design than a low bowl profile. Width and length proportions are designed to give maximum loading efficiency. And every component—particularly the apron, ejector, cutting edge—is likewise designed to do its part in achieving capacity loads.

LOADABILITY: The final result of this careful engineering is this: bigger loads—faster. LOWBOWL design gives the new Caterpillar No. 428 Scraper a faster loading rate because incoming material meets less material resistance and less friction from the load already in the bowl. While other scrapers are still in the cut struggling for the last few yards of their load, the new Cat units are on their way to the fill—with big pay loads!

NEW FEATURES: Outstanding new features of the No. 428 include: increased ground clearance—for high-speed travel in rough going; increased apron lift—for faster ejection of any material; large area pushblock—for better pusher contact.

NEW TIRES FOR THE DW15-No. 428

Both the CAT* DW15 (Series E) Tractor and No. 428 Scraper feature 26.5-25 wide-section tubeless tires—the product of extensive co-operative research by Caterpillar Tractor Co. and leading tire manufacturers. Tubeless tires offer load-carrying capacity comparable to conventional tires at a *reduced inflation pressure.* This gives better flotation and traction while decreasing rolling resistance. The wider tire treads take a "grouser like" bite, making more efficient use of engine horsepower. And tubeless tires eliminate 80% of the down time caused by tire failure.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

HOW TO KEEP PRODUCTION IN HIGH

High production rates depend on getting top performance from *all* your equipment *all the time*. And the surest and least expensive way to get efficient, dependable operation is through scheduled lubrication with lubricants specially developed for your equipment.

For example, you'll get better chassis protection with a lubricant that seals itself in the bearings . . . *Texaco Marfak*. This special chassis lube gives longer lasting protection against rust and wear, seals out dust and dirt. Its tough film stays put under repeated heavy impacts.

For a wheel bearing lubricant that stays in the bearings and off the brakes . . . use *Texaco Marfak Heavy Duty*. It's an all-season lubricant that permits repacking on an extended mileage basis.

If you prefer just *one* lubricant for chassis, wheel bearing, water pump and other grease lubrication . . . use multi-purpose *Texaco Marfak Heavy Duty Special 2*. This lithium-base grease pumps easily, resists water washout and stays put in the toughest service.

And to give all kinds of rolls maximum protection from rust and wear . . . use *Texaco Track Roll Lubricant*.

Why not find out exactly how a few Texaco products can keep your equipment running efficiently *all the time*. Call the nearest of more than 2,000 Texaco Distributing Plants in the 48 States or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

MORE THAN 650 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Enter 1279 on Reader Card

INDUSTRY NEWS

Aggregate Plant Slated for Tacoma

WASHINGTON YTONG CORP., Seattle, Wash., announced plans for a plant to manufacture "ytong" lightweight aggregate in Tacoma, Wash. J. G. Ortengren, manager, said that construction will necessitate a $250,000 expenditure. The initial payroll will include 40 men.

The lightweight construction material is relatively new in the United States, but has been produced in Sweden for many years. Sand needed for the process will be brought to the plant by barge, and lime, by rail.

Starts Crushing Operation

JEFFREY STONE CO., a newly formed Arkansas firm, is constructing a $750,000 rock crushing plant near North Little Rock. W. D. Jeffrey of Fort Smith is president of both the new firm and Jeffrey Construction Co., which is building the Big Maumelle Dam.

Four hundred acres of land have been bought or leased at the quarry site, and are expected to provide stone for 25 years. Missouri Pacific Lines will provide rail shipment.

Officers of the firm, in addition to Mr. Jeffrey, are Pete Fowler, treasurer; Ray B. Tillery, vice president and secretary; Burk Tolliver, manager, and Max Shaver, designing engineer.

New Office for Phosphate Division

FLORIDA PHOSPHATE DIVISION, Davison Chemical Co. Division of W. R. Grace & Co., has completed a new office building at Bartow, Florida. The building occupies 170 x 70 ft., and houses 65 administrative, office and engineering personnel. Masonry block were utilized in construction of the one-story building which is air conditioned and centrally heated.

Texas Plant Operating; May Add Facilities

TEXAS PORTLAND CEMENT CO., Orange, Texas, began production recently at its new 700,000-bbl. plant, which is said to incorporate the latest innovations for manufacture of cement. Crushers, kilns, conveyors, grinding mills and all of the equipment was engineered and built by Kennedy-Van Saun Manufacturing & Engineering Corp., Danville, Pa.

Materials used in the process—oyster shells dredged from the Gulf of Mexico, clay and iron—are brought directly to the plant by barge. Current demand for cement in the Sabine Valley area which it serves presages a probable increase in yearly output. Needs of the area, now undergoing an extensive expansion program of industrial building and highway projects, were emphasized by Kent B. Diehl, company president. The plant was designed for expansion of output to keep pace with the demand.

Directors Approve Plans For Arkansas Plant

THE ARKANSAS-LOUISIANA GAS CO., Shreveport, La., announced its decision to build a $15 million cement plant near Foreman, Ark., in a telegram to Governor Orval Faubus of Arkansas. The governor was notified of the decision by the gas company's board of directors to form a wholly-owned subsidiary to operate the cement plant. Opening of the plant is scheduled for the fall of 1958.

At the 2,000-acre plant site there is estimated to be a 100-year supply of raw materials. The plant will employ 600 persons when in full production, said J. T. Stephens, brother of the Arkansas-Louisiana board chairman, W. R. Stephens.

New Sand Plant

HALE MINES, INC., New York, N.Y., opened a sand plant in West Putnam County, Fla., a few weeks ago. The plant, constructed at a cost of $150,000, has a capacity of 1,000 tons of graded sand per day and stor-

(Continued on page 61)

KOEHRING WORK CAPACITY *in action . . .*

At a Mid-West quarry, ¾-yard 305 loads out lannon stone. It's another in a new series of Koehring machines, and is similar in basic design to the modern new ½ and 1-yard excavators. Has full complement of standard attachments, on crawlers and rubber (see capacity chart below).

Plenty of pick-up — At an isolated camp in the Sierras, pumps and other machinery had to be unloaded and set in place. The heavy units required careful, precision-handling — and plenty of lift capacity. Above photo shows how they did it with a Koehring 15-ton 205 truck crane.

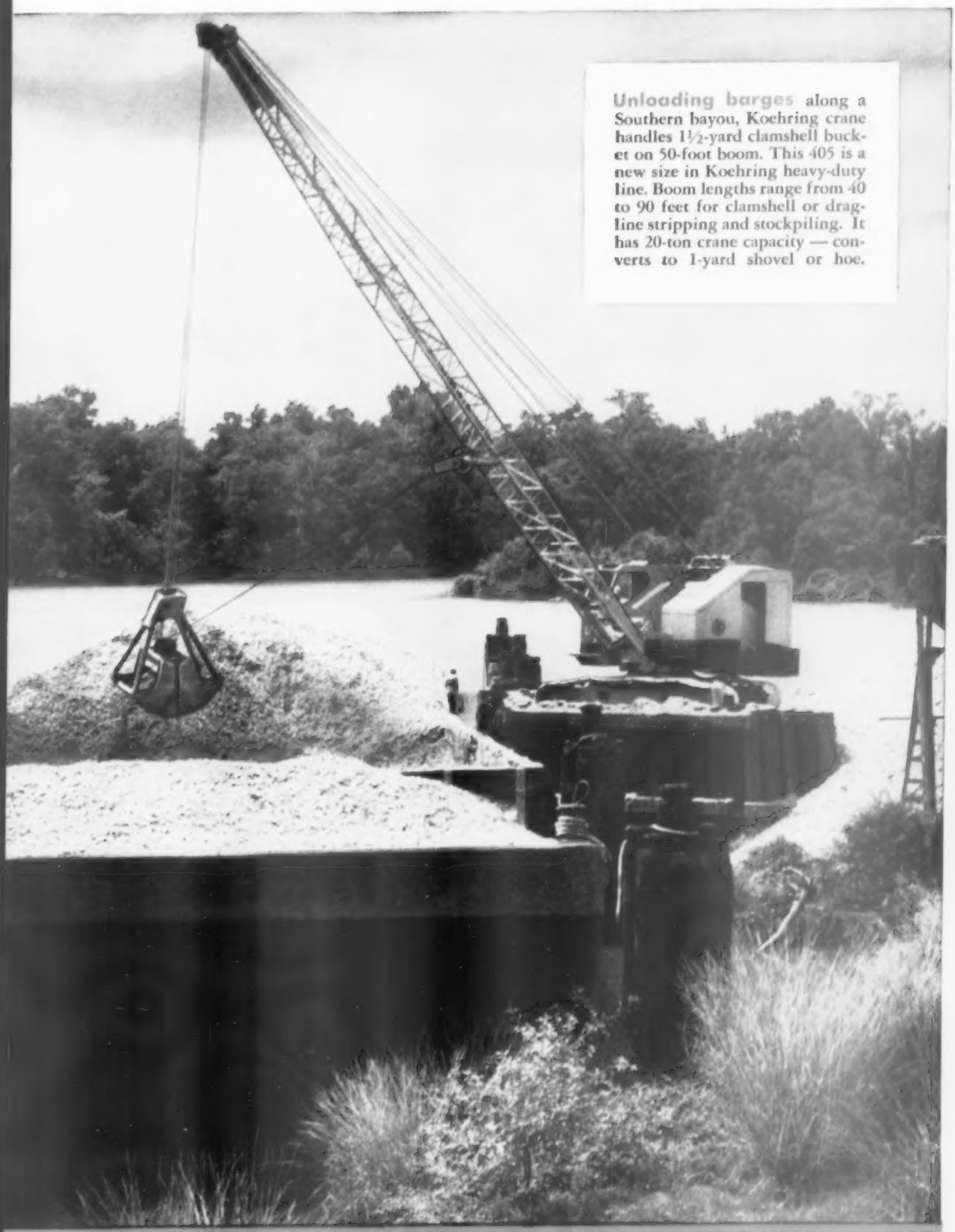
Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-foot radius
205 ON RUBBER	½-Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-foot radius
1305 CRAWLER	3-Yds.	190,000 lbs.	at 13-foot radius

Want more information? Call Koehring distributor today.

KC93

Big producer — Deep stripping uncovered a heavy coal vein at this Eastern mine. Working on mine floor, a Koehring 605 shovel loaded out the coal, and dumped into trucks spotted on upper level. Depending on materials, and type of operation, the 605 can be used with standard 22-ft. shovel boom and 16½-ft. dipper-sticks — or with high-lift 28-ft. boom and 23-ft. dipper-sticks.



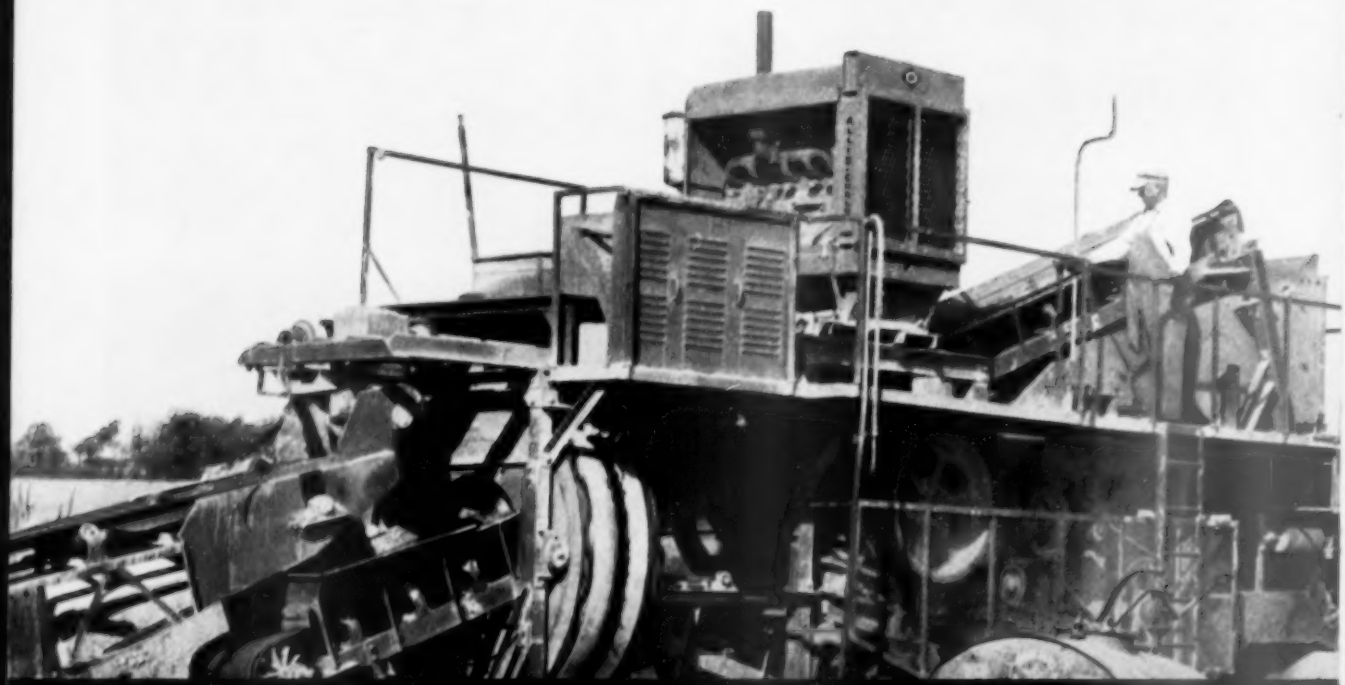
Unloading barges along a Southern bayou, Koehring crane handles 1½-yard clamshell bucket on 50-foot boom. This 405 is a new size in Koehring heavy-duty line. Boom lengths range from 40 to 90 feet for clamshell or dragline stripping and stockpiling. It has 20-ton crane capacity — converts to 1-yard shovel or hoe.

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

Enter 1310 on Reader Card

"I like it the best of any engine we have had—wish we had one on the shovel," says the job superintendent about the Allis-Chalmers 6DA-844 diesel powering this crusher.

With 30 to 50% fewer moving parts, this Allis-Chalmers diesel...



...PUTS MORE ROCK THROUGH THE CRUSHER

THERE IS UNUSUAL SIMPLICITY in Allis-Chalmers engines. The 6DA-844 diesel shown working above, for instance, *has 30 to 50 percent fewer wearing parts than competitive engines!*

THAT MEANS LESS WEAR . . . LESS THAT CAN GO WRONG when parts are fewer and stronger. Your equipment keeps working; you get more rock through the crusher.

MORE POWER GOES TO WORK with Allis-Chalmers engines — not only because there are fewer moving parts, but because more efficient combustion means maximum power from the fuel.

You can have this simplicity, economy and durability in Allis-Chalmers engines of *any* size or type, 9 to 516 hp — *any* fuel, LP or natural gas, gasoline or diesel — for *any* application. See your Allis-Chalmers dealer for full information. Allis-Chalmers, Buda Division, Milwaukee 1, Wisconsin. BC-7

ALLIS-CHALMERS *Engineering in Action*

(Continued from page 59)

age facilities for 30,000 tons of sand.

A specially designed barge sucks sand and water, delivering it to grading hoppers through 8-in. pipe. The push-button operation requires from four to six men to mine 1,000 tpd. Trucks are loaded from a hopper fed by a conveyor belt system leading from a tunnel under the sand drying piles. The company built half a mile of railroad track to serve the plant.

Kaiser Announces Merger

KAISER INDUSTRIES CORP., Oakland, Calif., and J. A. McEachern Investment Co., Seattle, Wash., announced plans to merge whereby the latter firm would become a subsidiary of Kaiser Industries. The two companies have been closely associated for years in many heavy construction projects, and also as founding stockholders in Kaiser Aluminum and Permanente Cement Co.

McEachern shareholders would receive approximately 2,272,000 shares of Kaiser Industries common stock and about 410,000 shares of its preferred stock. In exchange, Kaiser Industries would acquire McEachern assets, consisting of approximately 1,164,000 shares of Kaiser Aluminum & Chemical Corp. common stock, about 527,000 shares of Permanente Cement Co. common stock and cash and other assets of about $6,250,000.

Lime Plant Completed

SARGENT CALCIUM CO., Des Moines, Iowa, has completed a $250,000 limestone plant at Alden, Iowa. The firm will produce calcium for livestock and poultry feed manufacturers and mixers, milking parlor lime for the dairy industry and soil vitalizer for lawns and gardens. E. I. Sargent, Des Moines, formerly with the Sargent Feed Co., heads the firm; Reed Merrick, formerly with the Sargent company and the Sargent division of International Milling Co., is sales manager and Wayne Zeiger, plant manager.

Gypsum Production

DOMESTIC OUTPUT OF GYPSUM in the fourth quarter of 1956 declined to bring the year's total two percent under 1955, according to the U. S. Bureau of Mines. Imports of gypsum in 1956 ran nine percent ahead of the year before, totaling 4,346,854 short tons.

(Continued on next page)

INDUSTRY NEWS

(Continued from preceding page)

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of March, 1957 and total awards for the first three months of 1957 were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during: March, 1957	First 3 Mos.
Roads	4,659,970	13,074,765
Streets & Alleys	1,899,007	4,888,855
Airports	3,022,783	6,010,380
Totals	9,581,760	23,974,000

Reactivates Quarry

GENERAL CRUSHED STONE CO., Easton, Pa., is reactivating the Rock Cut quarry near Jamesville, N.Y., formerly operated by Rock Cut Stone Co. Equipment for quarrying, crushing, washing and grading has been installed at a cost of $1 million. The company has about 150 acres at the site, where limestone rock face averages up to 50 ft. H. M. Van Cleve is district sales manager; E. Z. Cole is plant superintendent; and John C. Hayes is being transferred from Rochester, N.Y., to be assistant district sales manager.

New Lehigh Plant

LEHIGH PORTLAND CEMENT CO., Allentown, Pa., is planning a new cement plant at Mitchell, Ind., replacing the present plant which has been in operation for half a century. The new installation, with two rotary kilns, will be erected adjacent to the present one, and is scheduled for use by late 1959. The kilns will be equipped with latest dust collecting devices, according to C. E. Eichelberger, general manager of the Mitchell operation.

Alpena Quarry Opens

WYANDOTTE CHEMICALS CORP., Wyandotte, Mich., has installed new stone crushing equipment at its Alpena, Mich., limestone quarry, which was put into operation at the start of the crushing season. The quarry supplies limestone to Huron Portland Cement Co., as well as stone for the Wyandotte plant. Four Great Lakes ships —Alpena, Huron, Conneaut and Wyandotte—transport the limestone from Alpena to Wyandotte.

•

DOLOMITE PRODUCTS CO., INC., Zanesville, Ohio, has purchased 54½ acres of the George W. Clark farm, which adjoins the company's quarry. The land was acquired for possible expansion.

(Continued on page 69)

Double your secondary crushing capacity with a CEDARAPIDS PORTABLE PRIMARY

...and get all these other advantages!

- Work pits with high percentages of oversize
- Handle previously rejected boulders or big rock
- Meet 100% crushing specifications
- Open up pits considered unworkable or exhausted
- Convert your gravel plant to a rock plant

THERE'S A SIZE AND TYPE OF CEDARAPIDS PORTABLE PRIMARY FOR EVERY PRIMARY REDUCTION JOB

IT'S A PROVED FACT!

With a Cedarapids Portable Primary *of the size and type to fit your conditions* to handle the heavy crushing load ahead of your secondary equipment, you can double your plant capacity!

It adds a third stage of reduction to your operation, permitting your secondary crushers to handle twice as much material. It reduces the circulating load. More material will be taken off by the screen in your secondary plant before it reaches the crusher.

Equipped with a vibrating grizzly or scalping screen, your Portable Primary by-passes fines, sand, chips or dirt to prevent choking of the crushers.

You can turn *all* pit-run material, even big boulders, into specification 100% crushed aggregate. You'll have the capacity and flexibility to handle a wider variety of jobs . . . open up deposits considered unworkable because of excessive oversize or fines, re-open pits thought to be exhausted, operate in pits or quarries closer to the job to save hauling costs.

Single Jaw Crusher

15" x 24" 25" x 40"
22" x 36" 30" x 40"

Twin Jaw Crusher

18" x 36"

with low-cost Vibrating Grizzly

Increases output of primary crusher up to 25% by by-passing fines before they reach the crusher. Three sizes available with single or double deck.

with Scalping Screen

48" x 6' horizontal vibrating screen between feeder and crusher increases production in pits with low percent of crushing, or where specifications require 100% crushed particles.

Portable Double Impeller Impact Breakers

30" x 42" 36" x 45"

With a reduction ratio of 20 or 30 to 1, this unit assures high capacity of desirable cubical shaped aggregate, which needs little or no further reduction.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Enter 1311 on Reader Card

NEW...and full of BIG features for you!

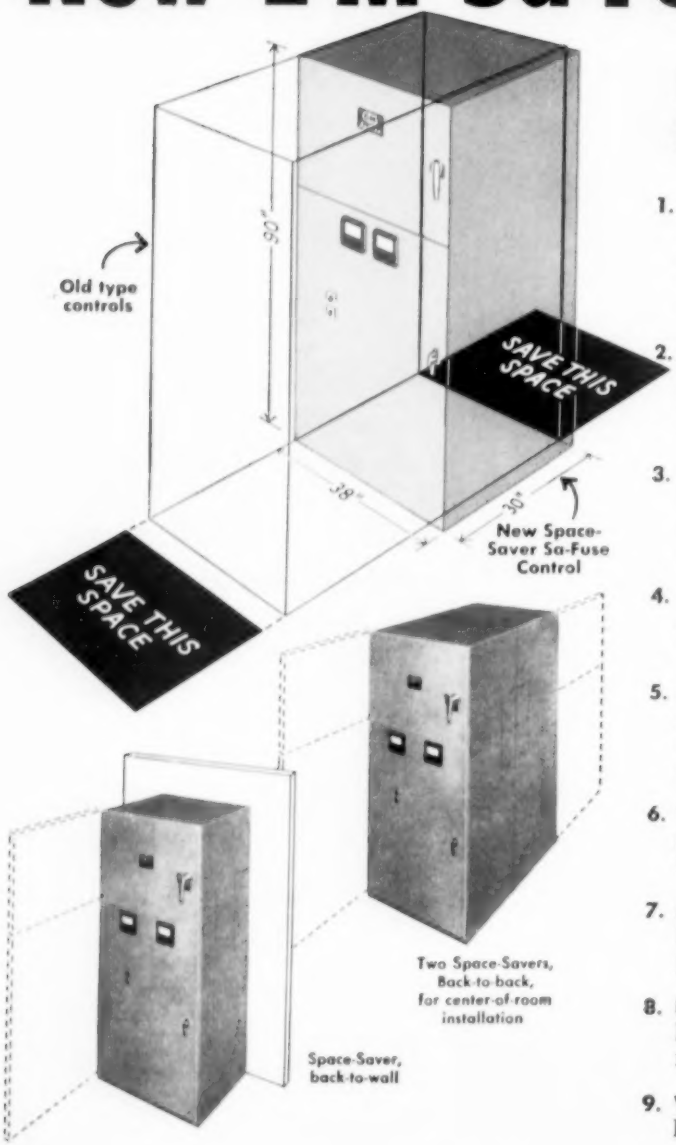
NEW

Space Saving
Safety
Easy Access
Easy Installation

CHOICE of Air or Oil Switch

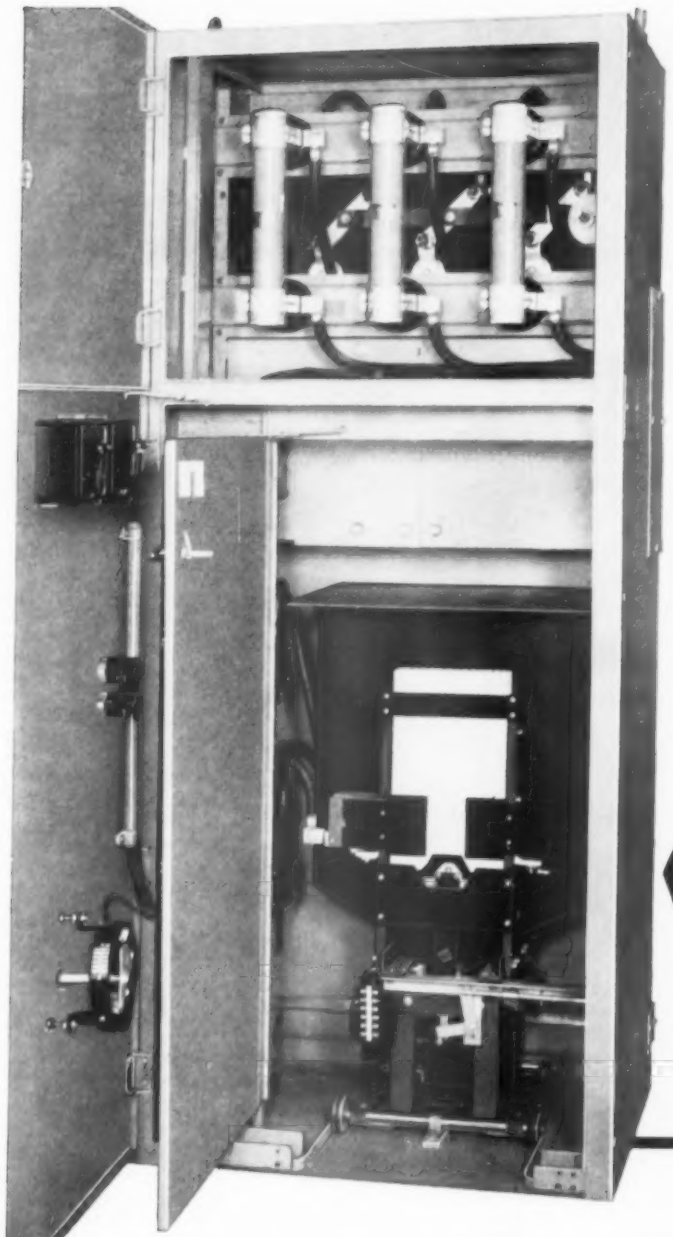
YOU GET THEM ALL IN THE

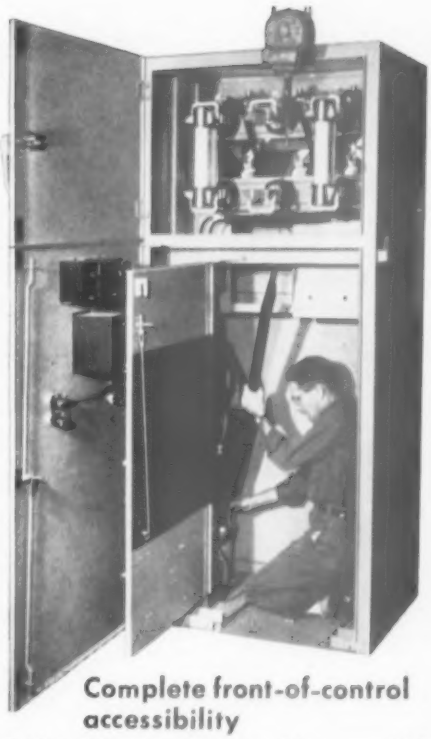
New E-M Sa-Fuse Control



✓ *Check these outstanding* SA-FUSE Features:

1. **CONTROL DEPTH CUT IN HALF.** The new Space-Saver SA-FUSE Control is only *half as deep* as old type controls. Space-Savers require no wasteful rear aisle. You get almost *twice as many* new Space-Savers into any given area.
2. **COORDINATED MOTOR PROTECTION.** Thermal relays and current-limiting fuses work together to protect against sustained overloads and short circuits.
3. **POLARIZED FIELD FREQUENCY RELAY,** invented by E-M, gives simplest, most foolproof, and most completely effective "conscious" control of synchronous motors.
4. **"SPOT CHECK" DISCONNECT SWITCH.** A glance at ganged disconnect switch quickly confirms that its blades are open and *grounded.*
5. **FOUR-WAY SAFETY INTERLOCK.** Personnel are guarded by interlocking between a-c contactor, disconnect switch door, disconnect switch, and contactor compartment door.
6. **ISOLATED HIGH VOLTAGE COMPARTMENT** is separated from low voltage chamber by a key-locked, hinged relay panel.
7. **FRONT-CONNECTED LOW VOLTAGE COMPONENTS** are mounted on front of hinged relay panel enclosing a-c contactor.
8. **RUGGED STEEL CABINET** is fabricated from heavy gage steel plate for extra strength and rigidity.
9. **VAULT-TYPE LOCKING.** Main door has 3-point locking for safety and freedom from vibration.



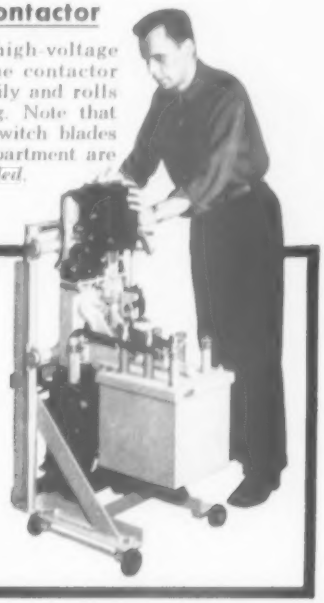


Complete front-of-control accessibility

Cable pulling is easier in the big, roomy high-voltage compartment. Power cables enter through top or bottom of cabinet.

Here's Sa-Fuse with roll-out air-break contactor

Isolated in the high-voltage compartment, the contactor disconnects easily and rolls out for servicing. Note that the disconnect switch blades in the fuse compartment are open and *grounded*.



ROLL IT IN...ROLL IT OUT!

The new E-M Oil Switch is an option. It's a rugged oil switch specially designed for motor starting duty. Control transformer is mounted with it on roll-out assembly.

When you're thinking about motor controls, be sure to ask your E-M Sales Engineer about SA-FUSE. He will be glad to give you details about the better motor control. Also, write today for your personal copy of the informative SA-FUSE brochure, No. 1133.

E-M

ELECTRIC MACHINERY MFG. COMPANY

Minneapolis 13, Minnesota

Originators of the safety gang disconnect high-voltage fuse control

3300-TPA-2156

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PETTIBONE

UNIVERSAL WOBBLER

FEEDS AND SCALPS IN ONE OPERATION

won't clog in wet, sticky material

Elliptical-shaped bars form the bed of a hopper and are set in alternate vertical and horizontal positions. Turning of the bars imparts a rocking, tumbling forward motion to the load. Fines drop through spacing between bars. Oversize is delivered off the end.

The Wobbler Feeder increases crusher capacity by removing fines ahead of the crusher. Unlike a screen, the Wobbler does not vibrate — nor clog in wet, sticky material.

This combination feeder-scalper is needed in every mining operation. Here are a few uses now being made:

IRON ORE—The Wobbler is used as a portable machine to follow a shovel in reclaiming scattered ore stockpiles. Unwanted material is separated at the pile . . . usable ore is then trucked economically to mills and concentrating plants.

BAUXITE—A large number of Wobbler Feeders are being used by one of the Aluminum companies to separate fines from oversize in this gummy material — no clogging.

SLAG—The use of a Wobbler Feeder in place of a bar grizzly has cut grizzly maintenance from two days a week to four hours a month.

LIMESTONE—The Wobbler is removing 94% of fines ½-inch and under in the cement industry — for increased hammermill capacity.

Universal's Wobbler Feeder . . . . the profit machine for aggregate producers and road builders. Available in combination with Universal portable crushing plants. Discuss with your Universal distributor.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

617 C Avenue, N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

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INDUSTRY NEWS

(Continued from page 64)

Modernization Completed

OREGON PORTLAND CEMENT CO., Portland, Ore., has effected a 100 percent increase in production at its Lime, Ore., plant with a recently completed modernization program. Giving the plant a 1,000,000-bbl. capacity, new equipment includes a 350-ft. kiln with clinker cooling system, stack, raw and finish grinding mills and slurry basins. Quarry facilities also have been improved, with addition of a P & H shovel, two large Euclid trucks and an Ingersoll-Rand Drillmaster.

Schedule July Production

NATIONAL LIME AND STONE CO., Findlay, Ohio, expects to open its new quarry south of Buckland, Ohio about the first of July, according to John Joseph, general superintendent. The $125,000 plant will produce agricultural limestone and crushed stone for road construction, asphalt, concrete and railroad ballast.

Develops Gypsum Holdings

BESTWALL GYPSUM CO., Ardmore, Pa., will proceed with development of its Nova Scotia gypsum deposits, according to Rawson G. Lizars, president. "We will proceed with the overall gypsum expansion program as we believe conditions are favorable for the commitment of capital, as well as for consumer demand for our products," Mr. Lizars said.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 19,308,000 bbl. of finished cement during January, 1957, as reported by the Bureau of Mines. This was a decrease of 10 percent from January, 1956. Mill shipments totaled 11,805,000 bbl., a decrease of 11 percent, compared with January, 1956, while stocks on hand were 29,819,000 bbl., 17 percent more than on the same date a year ago. Clinker production during January, 1957 amounted to 24,412,000 bbl., a decrease of three percent from the January, 1956, figure. The output of finished cement came from 158 plants in 37 states and Puerto Rico. During the same period of 1956, 21,440,000 bbl. of finished cement were produced.

Opens New Level In Limestone Mine

WARNER CO., Philadelphia, Pa., is developing a drift at the 960-ft. level at its Bell Mine, Bellefonte, Pa. The new level, 360 ft. below the present 600-ft. level, and 112 ft. below sea level, will make available vast new reserves of limestone in the 60-ft. thick Bellefonte ledge.

In moving the stone, the company is making use of conveyor belts traveling along a reversing tunnel. One of the belts is 670-ft. long, and the other is 713-ft. long. Each is driven by a 100-hp. motor. The main shaft is being extended downward to accommodate a hoist car for workmen. At the new level, where the shaft and the end of the sloping belt tunnel meet, production drifts will be opened to the east and west through the limestone vein, and an electric railway will be installed similar to the one at the upper level. Stone will be crushed to a maximum of 8 in. before being loaded on the conveyor.

Subsidiary Changes Name

THE NORTH JERSEY QUARRY CO., Morristown, N.J., has been redesignated as Houdaille Construction Materials, Inc., according to an announce-

(Continued on page 72)

Coming Conventions

June 6-8, 1957—
National Lime Association, Annual Convention, Broadmoor Hotel, Colorado Springs, Colo.

June 16-21, 1957—
American Society for Testing Materials, 60th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N.J.

June 17-18, 1957—
National Agricultural Limestone Institute, Mid-Year Meeting, Board of Directors, Edgewater Beach Hotel, Chicago, Ill.

June 19, 1957—
National Crushed Limestone Institute, Mid-Year Meeting, Board of Directors, Edgewater Beach Hotel, Chicago, Ill.

July 17-18, 1957—
National Crushed Stone Association, Mid-Year Meeting, Board of Directors, The Homestead, Hot Springs, Va.

August 25-31, 1957—
National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, Manoir Richelieu, Murray Bay, Quebec, Canada

September 9-12, 1957—
American Mining Congress, 1957 Metal Mining and Industrial Minerals Convention, Salt Lake City, Utah.

October 9-11, 1957—
National Slag Association, 40th Annual Meeting, Plaza Hotel, New York, N.Y.

October 17-19, 1957—
Empire State Sand, Gravel and Ready Mix Association, Annual Meeting, Lake Placid Club, Lake Placid, N.Y.

RESEARCH-COTTRELL'S

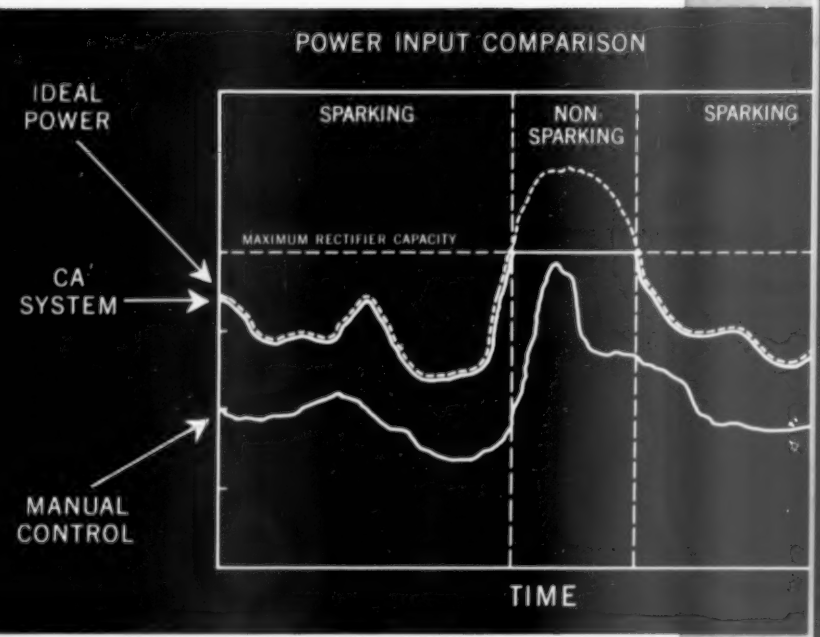
New CA System

brings

Auto

to precipitators

Higher "around-the-clock" collection efficiency without any manual adjustments. That sums up the major advantages of Research's new Cottrell Automation System.



The chart at the left shows how the CA System provides these advantages. As you know, ideal electrical power input to a precipitator is not constant. It varies with changes in gas composition, temperature, rate of flow and humidity, as well as characteristics of the dust, such as size, electrical resistivity and extent of build-up on the electrodes. With conventional controls, manual adjustments cannot keep pace with these changing conditions. This difference between *ideal* electrical power and *actual* power input, under manual control, is shown in the chart. This

mation

difference means lower collection efficiency.
The fast acting electronic circuits of the CA System provide the best practical approach to ideal electrical power. During periods of sparking, electrical power input is controlled by the optimum sparking rate, which can be easily pre-set to any value between 0 and 500 sparks per minute. Under some conditions power input would have to be increased beyond the capacity of the electrical equipment in order to maintain this optimum sparking rate. During such periods the power input is governed by the *capacity* of the electrical equipment. This condition is shown in the center vertical section of the chart.
For more information on this new automation development write for your copy of Bulletin CA. It has a detailed description of how the Cottrell Automation System works and how higher "around-the-clock" collection efficiencies and lower operating costs are obtained.

Research-Cottrell

RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y. Grant Building, Pittsburgh 19, Penna. • 228 No. La Salle St., Chicago 1, Ill. • 58 Sutter Street, San Francisco 4, Cal.

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INDUSTRY NEWS

(Continued from page 69)

ment by Ralph F. Peo, president of Houdaille Industries, Inc., the parent company. Acquired in March, 1956, North Jersey Quarry Co. and its subsidiaries, Consolidated Stone & Sand Co. and Portland Sand & Gravel Co., provides a large market with sand, gravel, stone, concrete and allied products.

The name change was made "to further our corporate identity and to facilitate expansion of service from all units within the Houdaille group," said Mr. Peo. The subsidiary will continue to occupy its present offices, and executive and production personnel will continue in their present jobs.

Kiln Increases Output

CANADA CEMENT LTD., Toronto, Ont., Can., has brought a second kiln into operation at its Woodstock, Ont., plant, bringing total capacity of that plant to 3,000,000 bbl. per year. The Montreal East plant is undergoing the first phase of a second major project installation of new grinding facilities. The company estimated an expenditure of $8 million to complete capital projects in 1957.

African Industry Expands

PRETORIA PORTLAND CEMENT CO. AND CAPE PORTLAND CEMENT CO. have formed expansion plans involving a total expenditure of more than $12 million for the South African cement industry.

Pretoria Portland Cement Co. will enlarge its facilities, installing an additional kiln with 1,000,000 bbl. annual capacity. The Cape Cement Co. will install a cement plant on land where it has extensive limestone deposits.

New Incorporations

BLUE RIDGE STONE CO., Greenville, S. C., has been granted a charter to quarry, crush and process stone. Capital stock was listed at $15,000. H. L. Peden is president.

SUPERIOR LIMESTONE PRODUCTS, INC., Oakland, Iowa, with authorized stock of $500,000, has been incorporated by Herman E. Snater and Frank McArthur, both of Oakland, T. L. Robinson, Des Moines, Donald Lyman, Red Oak and Albert J. Keiser, Omaha, Neb.

FRANK B. SGARLAT SAND GRAVEL CO., Forty Fort, Pa., has been authorized to engage in the sand and gravel

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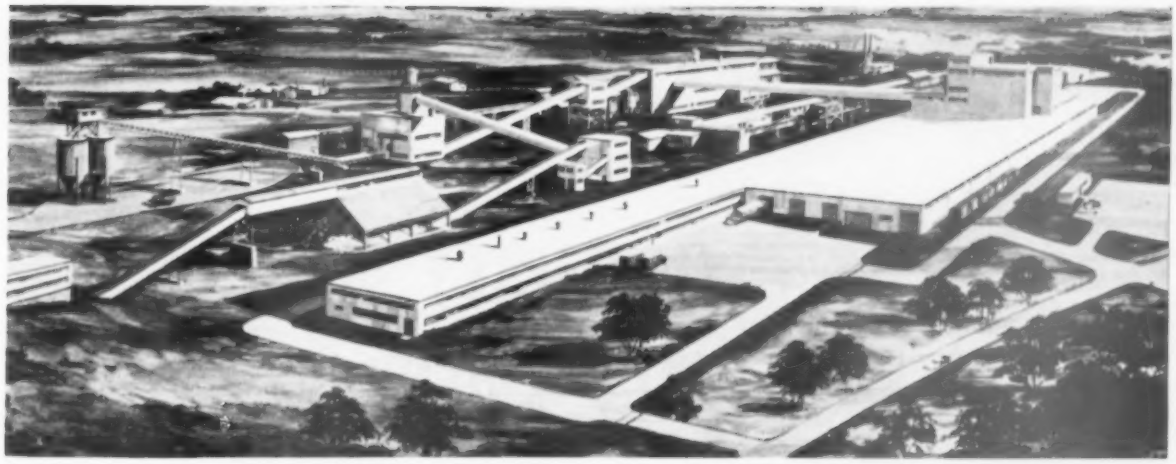


Barber-Greene installation at new Celotex plant. Ten of the eleven conveyors are housed. Building at far left houses primary crushers. At right is wallboard plant. Mill is in background.

(Left). Material rejected by the separator is carried to two storage bins by this 329-foot Barber-Greene conveyor. Standard 60-inch truss minimizes the number of supports required. (Right). A 422-foot conveyor in gallery utilizes traveling tripper to build long stockpiles.

1600′ conveyor system serves new Celotex plant

Eleven Barber-Greene conveyors are incorporated in the design of a new plant of the Celotex Corporation.

The 1600-foot conveyor system handles every product from the raw, heavy gypsum rock to the fine finished plaster. This processing requires a wide variety of types and sizes of conveyors—all coordinated to deliver continuous high capacity at lowest operating cost.

Built with *standardized* components, these versatile conveyors are delivered faster, go up easier and require less costly engineering time.

These pre-engineered components can be used in almost limitless combinations, from the most complex systems right down to the small setups requiring a single conveyor. When it comes to adapting Barber-Greene conveyors to meet changing needs, standardized components make the job easier, faster and more economical.

Write for literature on the conveyors pre-engineered to cut costs

56-23-PE

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Enter 1298 on Reader Card

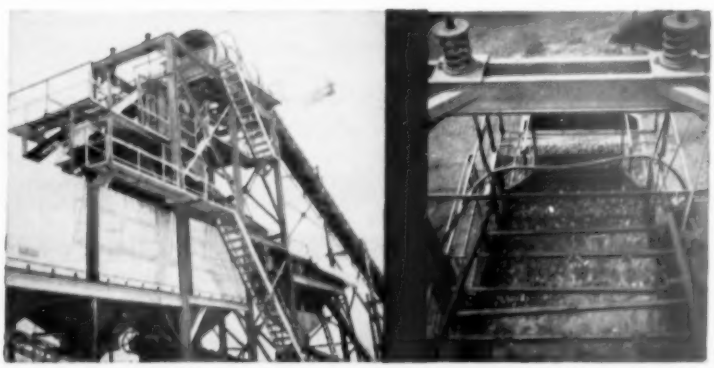
3,000 TONS OF

handled by a SIMPLICITY grizzly feeder at Badger Materials in Indiana

On the Indiana Turnpike, Badger Materials Co. is using a Simplicity Grizzly Feeder to handle 3,000 tons of aggregate a day, some of it well over 16 inches in diameter. This same material is being accurately sized by a Simplicity Simpli-Flo two bearing screen. A Smooth operation throughout.

Start of the operation is shown here as a seven-yard truck dumps aggregate into a 25-yard receiving hopper. Feeding from this hopper is a Simplicity 3' x 10' OA-10-A2 Grizzly Feeder. The stone is fed off the grizzly bars and into a large gyratory crusher. The undersized material passes easily through the bars and onto a belt running under the crusher (the belt also receives crushed stone from the crusher). From here the material is fed into a plant which acts as a secondary crusher.

The material then travels up another belt, goes through a washer, and is discharged . . . onto a Simplicity 4' x 12" Simpli-Flo, 3-deck screen. Further washing is accomplished by spray bars on the Simpli-Flo, which is suspended by overhead springs and cables. The various sizes of material are dropped into hoppers and hauled away by trucks. Sand and undersized are sluiced off for separation.



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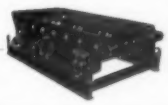
AGGREGATE A DAY

Simplicity Simpli-Flo Screens are two-bearing screens, generally hung by springs and cables from overhead supports. Simpli-Flo screens omit the usual main frame and outboard bearings, thereby offering minimum width for installations where width is a problem. On these double-end drive screens, the eccentric shaft is counter-balanced for efficient true circle operation; bearings are heavy duty eccentric type, protected against dust and water by labyrinth seals; discharge lips are readily accessible; and screen cloth is arranged for easy changing.

The Simplicity Grizzly Feeder combines scalping and feeding in one operation. This unit eliminates the old type arrangement of apron feeder and stationary grizzly. You will gain additional plant room. Your operating and maintenance costs will be cut by 50%. Simplicity Grizzly Feeders use an inertia type drive mechanism, and can produce heavy action, allowing sizes up to 6' x 20' and capacities up to 1,000 tons per hour. They maintain positive and controlled feed rates under the bin . . . bridging of material in the hopper is eliminated.

OTHER SIMPLICITY PRODUCTS INCLUDE:

- **Os-A-Veyor Feeders**
- **Simplicity Gyrating Horizontal Screens**
- **Simplicity 32 Series Balanced Conventional Pan Type Vibrating Conveyors**
- **Simplicity Woven Wire Screens . . . Send for Catalog No. 67**



ALL NEW FEEDER CATALOG..

Write today for free copy of Catalog No. 571 on Simplicity feeders and Grizzly feeders.

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario

FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 13, MICHIGAN

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INDUSTRY NEWS

(Continued from page 72)

business. Incorporators are Joseph F. Sgarlat, Stella M. Blaski, both of Forty Fort and Harry F. Sgarlat, Harveys Lake, Pa.

SAM B. SORENSON CORP., Woodworth, Wis., has been incorporated to deal in sand, gravel, excavating, etc., by Sam Sorenson, Carl H. Sattersten and Albertine N. Sorenson.

AGGREGATES, INC., and Aggregates Sales Co., Hazleton, Penn., have been granted charters to process minerals, rock and earth and to sell the products. Incorporators are Marian Wirth, Israel T. Klapper and Joseph J. Ustynoski.

Exports Phosphate Rock

ISRAEL MAY HAVE AN EXPORTABLE SURPLUS of more than 100,000 tons of phosphate rock during 1957, the first year in which large-scale exports have been feasible. Productive capacity has been raised to 180,000 tpy., and domestic needs account for 70,000 to 75,000 tons. Israel's output of phosphate rock in 1956 amounted to 117,000 tons. Equipment on order may provide a further increase in production, to 250,000 tons, in 1958.

New Crushing Plant

CRAWFORD LIME AND QUARRY CO., Cedar Rapids, Iowa, has installed a Universal 3645 Impact Master crushing plant at its Palo, Iowa, quarry. Geared to the Crawford operation, the plant was built by Universal Engineering Co. and installed by Herman M. Brown Co., Cedar Rapids. It will deliver 300 tons of stone crushed to 2½ in. and under per hour. Most of the plant's production will go to base course material for road construction, concrete and bituminous aggregate, ready-mixed concrete, concrete block and agricultural limestone.

Argentina Cement Production

PRODUCTION OF PORTLAND CEMENT in Argentina reached a record figure in 1956 of 1,966,000 metric tons, according to the country's Association of Manufacturers of Portland Cement. This was an increase of eight percent over the 1955 total of 1,823,000 metric tons.

Imports amounted to 50,000 tons in 1956, as compared to 219,000 tons in 1955. Total supply for the years 1955 and 1956 is placed at 2,042,000 and 2,016,000 tons, respectively.

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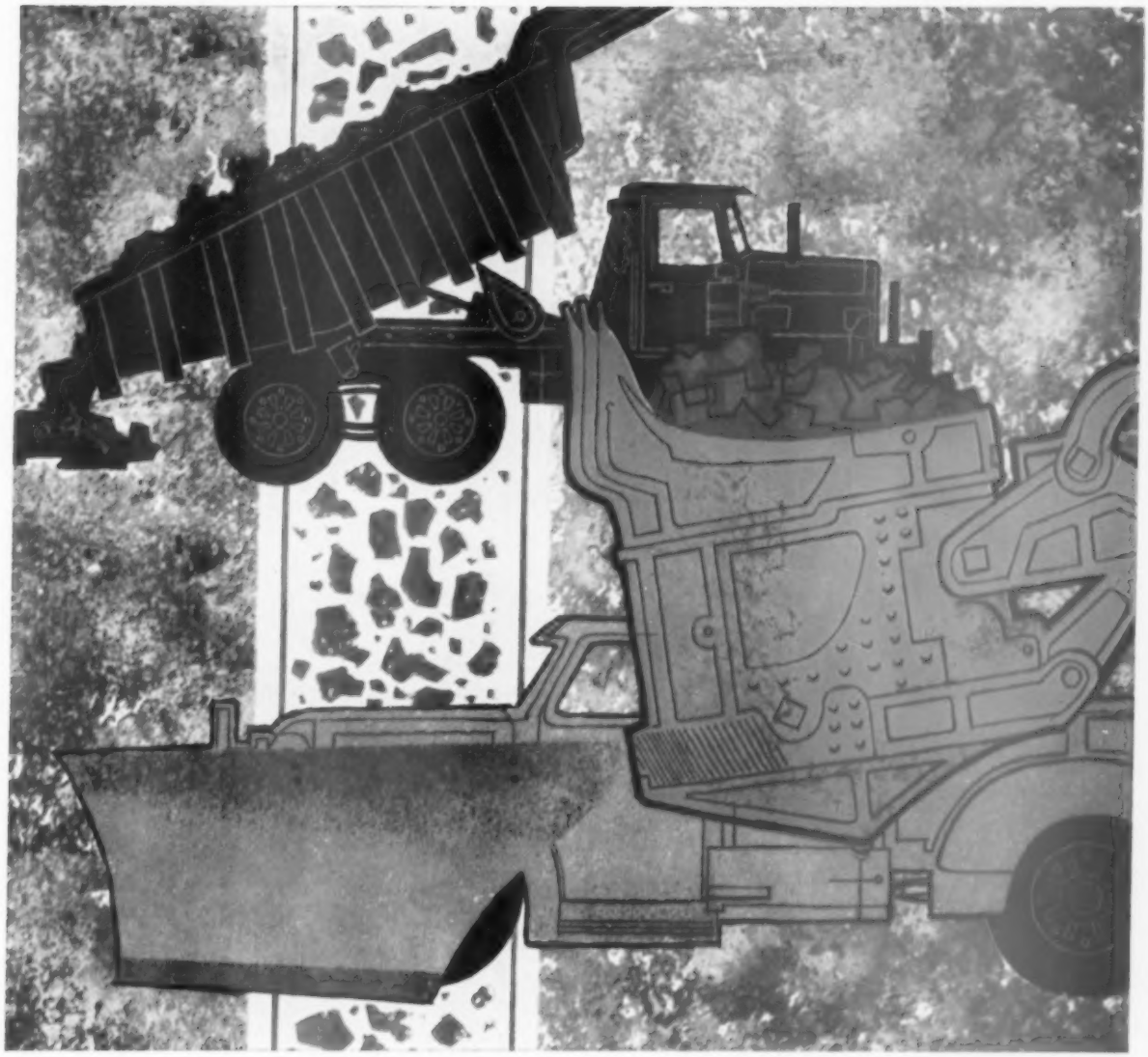

JALLOY special alloy steel

resists impact and abrasion in toughest applications

Heat treated Jalloy steels wear as much as 20 times longer than mild steels under rigorous impact and abrasive conditions. By using Jalloy you can cut maintenance costs drastically. Increased product life reduces downtime and lowers your labor costs.

Jalloy steels are available in the forms you require (plates, hot rolled sheets, hot rolled bars, small shapes and structurals). Jalloy can be purchased in three grades to meet specific use requirements: Grade 1, where formability is important; Grade 3, capable of being heat treated to excellent physical properties for good resistance to abrasion or wear; Grade 7, where high hardness with good ductility or wear resistance is desirable.

Your local distributor can supply you with latest information on these Jalloy grades, or you can write to Jones & Laughlin Steel Corporation, Dept. 481, 3 Gateway Center, Pittsburgh 30, Pa.

J&L STEEL

Jones & Laughlin

... a great name in steel

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INDUSTRY NEWS

(Continued from page 76)

Stock Registration Marks Start of Construction

REGISTRATION WITH THE SECURITIES and Exchange Commission of 1,600,000 shares of common stock of the Mississippi Valley Portland Cement Co. was announced the latter part of April. The shares are listed at a par value of $3.00. The announcement was made by Kent B. Diehl, Sr., supervising and coordinating engineer and a director of the new corporation at his office in Orange, Texas. Mr. Diehl is, in addition, president of the Texas Portland Cement Co. also located at Orange.

Announcement of the $4,600,000 stock registration coincides with the start of construction of a 2,000 barrel per day wet process portland cement plant for the Mississippi company north of Vicksburg on the Yazoo River. The general contractor assignment is being handled by Reed Construction Co. of Jackson, Miss.

Raw materials, according to Mr. Diehl, will be limestone and marl in proportions of 78 percent limestone and 22 percent marl.

A 10 x 400 ft. rotary kiln is to be installed by the Kennedy-Van Saun Mfg. & Engineering Corp. A 9 x 28-ft. raw mill by the same manufacturer will be on an open circuit. The finishing mill, 11 x 18 ft., will be closed circuit, with a 16 ft. air separator. The plans call for the kiln to be fired by natural gas.

It is planned to ship cement by truck only during the first months of operation, and later by rail and barge. Mr. Diehl says it is hoped that the plant will be in production in about nine months.

The following were listed by Mr. Diehl as officers of the new company: president, Robert W. Hyde, Jr., a Jackson, Miss. paving contractor; vice-president, Cecil F. Travis of Jackson; secretary, James C. Fowler of Jackson; treasurer, James W. Sanders, a textile executive of Jackson; general counsel and director, Robert L. Dent of Vicksburg. A. N. Morgan of Jackson is controller and principal accounting officer. In addition to these duties, Mr. Morgan is also a director.

Other directors include Carroll Low of Los Angeles, former vice-president for sales of Monolith Portland Cement Co. and Allan Moore, superintendent of the new Texas Portland Cement Co. plant at Orange.

General offices of the Mississippi Valley Portland Cement Co. are in Jackson, Miss.

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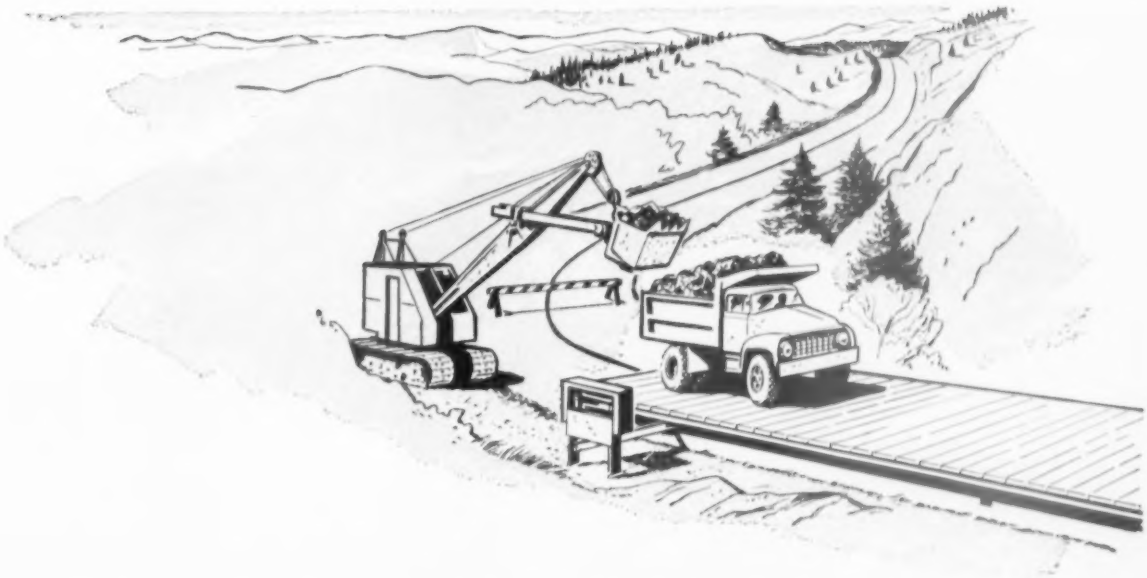
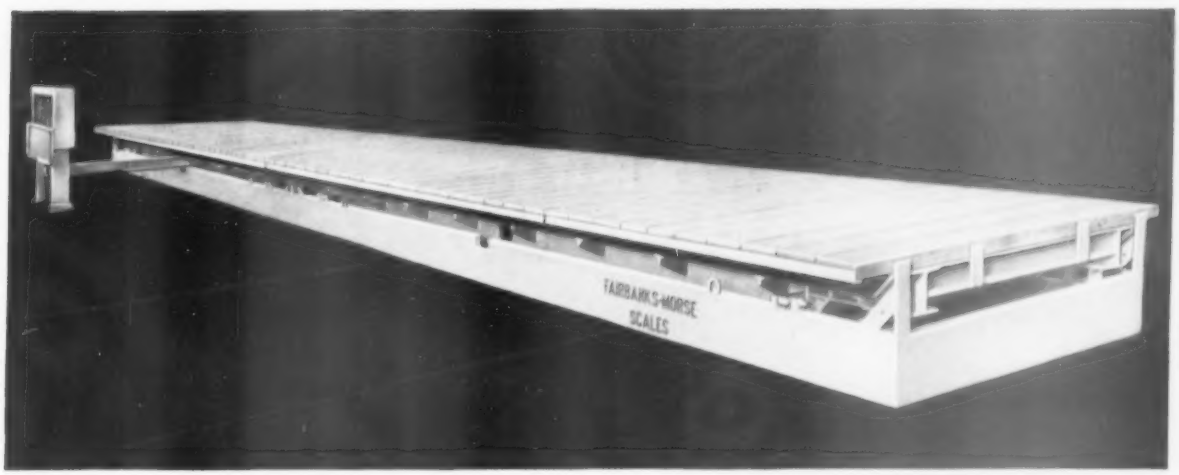


Weigh it at the job site



Here's a portable truck scale, completely self-contained, that can be transported by truck! Designed for use in road construction, at quarries, in gravel pits and on construction sites, the new Fairbanks-Morse Portable Vehicle Scale is a completely self-contained unit made to travel on a flat bed truck. No scale pit is needed!

Just take off the wooden platform panels, disconnect the transverse lever and tighten the hold-down bolts—and you have a package eight feet wide, legal to ride the highways.

Units can be used singly or connected in tandem to the same registering beam or dial. Standard models are available in eight lengths to 60 feet and in capacities of 30, 40 and 50 tons.

Analyze your present weighing practices. On-site weighing will probably save you time and money. Write today for the Fairbanks-Morse New Portable Vehicle Scale Bulletin No. ASM520.1. Fairbanks, Morse & Co., Dept. R P - 6, 600 South Michigan Avenue, Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

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INDUSTRY NEWS

(Continued from page 78)

Float Kiln Upriver to Plant

SIAM CEMENT CO.'S Ta Luang plant recently started up a 395-ft. rotary kiln supplied by F. L. Smidth Co., New York, N.Y. Besides increasing Thailand cement production almost 50 percent, the kiln aroused interest because of the unusual method by which it was transported from the Bangkok harbor to the plant site—it was floated the 60 miles up the Pa Sak River in seven sealed sections.

F. L. Smidth engineers settled on transporting the kiln by that method because harbor unloading facilities were few, and use of railroads would have meant building the kiln in many small sections. Towing them to the plant, the engineers then raised the kiln sections 26 ft. above the river by a series of cofferdams. A heavy wooden crane, operated manually with pulleys, hoisted the sections into final position, ready for welding. The whole job took less than three weeks.

Operation of the kiln will permit the company to increase clinker production from 420,000 to 600,000 tpy. This is the third kiln at the Ta Luang plant, which was erected in 1934. Another plant of Siam Cement Co. is at Bangsue. Only cement producer in that country, Siam Cement Co. was founded in 1913 and is one-half owned by the Thai royal family.

Choose Lime Plant Site

EDNA BAY PURE STONE CO., Dallas, Texas, has chosen a site on the Columbia River, Vancouver, Wash., for a limestone plant. Construction will begin soon on the $5 million plant that will employ 150 persons. Limestone will be hauled to the plant for processing from a quarry at Edna Bay, Alaska, and a daily capacity of 300 tons of lime is scheduled. Co-owners of Edna Bay Pure Stone Co. are Kent B. Diehl and Cullen F. McDougal, Dallas, Texas.

END

Now MOVE 40 TON LOADS AT LOWEST COST WITH THIS Euclid *R-40*

TWIN-POWER REAR-DUMP

470 OR 500 TOTAL H.P.
TORQMATIC DRIVES
18.00 x 25 TIRES
80,000 LB. PAYLOAD
26 CU. YDS. STRUCK

This model R-40 is the newest addition to Euclid's complete line of Rear-Dump haulers. Built for jobs where big loads must be hauled, it incorporates all of the advance design features that have made "Eucs" the standard of performance for hauling heavy excavation in construction, mine, quarry and industrial service.

Two power trains—each with separate engine, 3-speed Torqmatic Drive and planetary drive axle—provide plenty of power to move capacity loads over tough haul roads and steep grades. The tandem axles are spring mounted to permit fast travel on good haul roads . . . the R-40 has a top speed of 26 mph with full payload.

Hydraulic booster steering makes this big Euclid easy to handle in close quarters and on tough hauls. Dumping angle of 67° and smooth interior of exhaust heated body assure quick, clean shedding of the load into hoppers, over the bank, or on the fill.

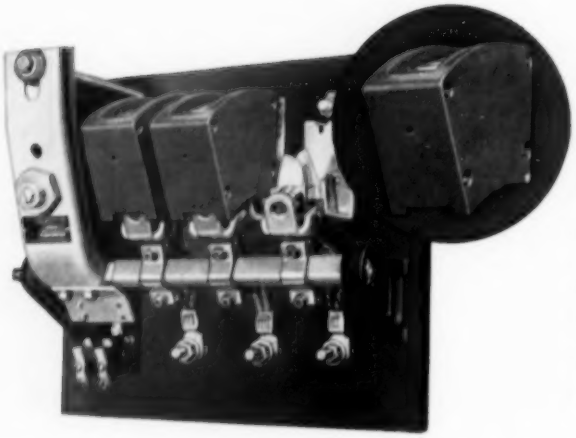
Your Euclid dealer will be glad to discuss the model R-40 and your off-highway hauling problems. He'll provide a production-cost estimate for present or planned operations, and can show you why ***Euclids are your best investment.***

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

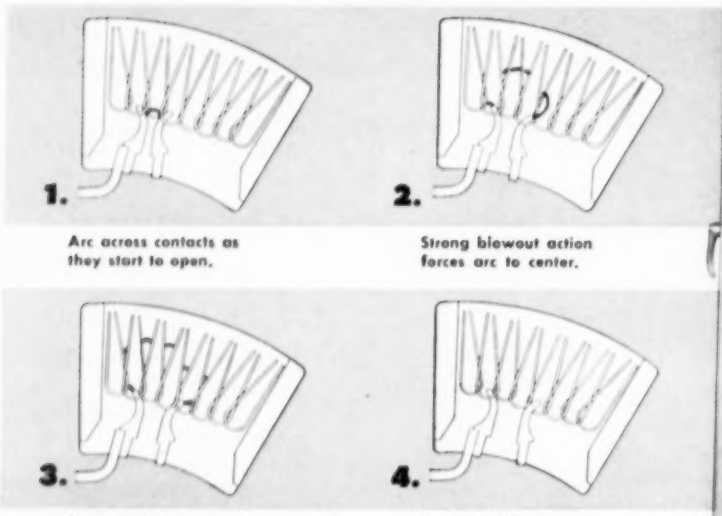
FOR MOVING EARTH, ROCK, COAL AND ORE

for fast arc interruption... without blowout coils

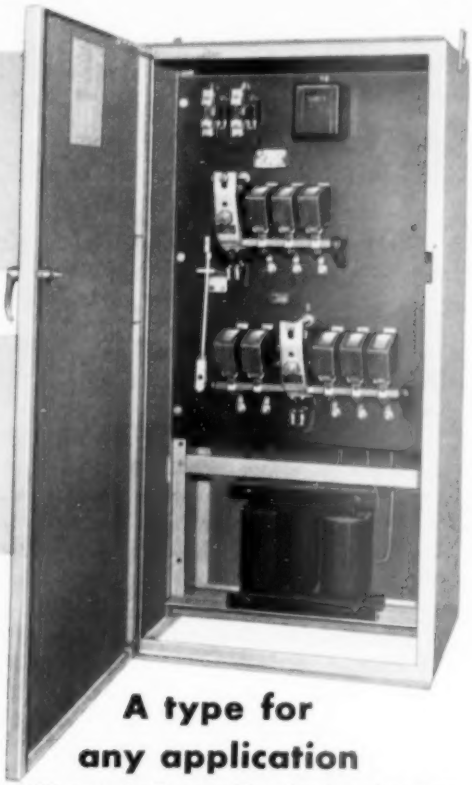


ALLIS-CHALMERS
TYPE 425 CONTROL
featuring ACBO arc-centering blowout chutes for 50 to 400 hp

The advanced electrical design of Allis-Chalmers Size 4, 5 and 6 control incorporates a modern principle of arc interruption for low voltage, high horsepower applications. The *ACBO* arc chute utilizes principles of magnetic action and thermal convection to center, rupture and extinguish the arc . . . quickly. Fast arc interruption assures maximum contactor efficiency, improves performance — greatly prolongs contact and chute life.



1. Arc across contacts as they start to open.
2. Strong blowout action forces arc to center.
3. Arc rupturing.
4. Contacts fully open—arc extinguished.



Simplified mechanical design

- Streamlined clapper-type construction eliminates many parts.
- Accessibility simplifies maintenance and inspection.
- Installation is fast and easy . . . sensible enclosure dimensions provide ample wiring space.

A type for any application

Type 425 control offers a wide selection of starters and contactors for any application. For detailed information, call your A-C Control Distributor or your local A-C District Office . . . or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin. Ask for Bulletin 14B8615.

A-C ALLIS-CHALMERS

ACBO is an Allis-Chalmers trademark.

ALLIS-CHALMERS

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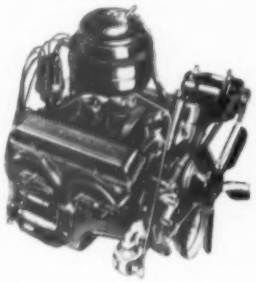
POWERFUL REASONS WHY A CHEVROLET STAYS ON THE JOB...SAVES ON THE JOB!

COMPACT CHEVY V8

(weighs up to 150 lbs. less than others)

- Shortest stroke of any truck V8
- Short, durable connecting rods
- Vertically compact cylinder block
- Rugged yet light crankshaft
- Efficient hydraulic valve lifters
- Long-wearing Moraine bearings



Chevrolet trucks are powered by V8's that make every ounce count. Because of their trimmed-down design, they use less power to haul their own weight and put more power into hustling your cargoes. Like all Chevrolet truck components, these engines are efficient performers—and that means top economy and dependability!

Chevy's the dollar saver *de luxe* of the American road, and many of the reasons why can be found beneath the Chevrolet truck hood. That's where you'll often find a great V8 that's at the head of its class for compact, *efficient* short-stroke design. You won't find features to equal all those listed here (at left) in any other truck V8's today. Or, if you prefer a 6, Chevy's got the most popular 6-cylinder powerplants in the history of hauling. They're honest-to-goodness *truck* engines, specially built to *stay* and *save* on rough, tough hauling jobs.

You'll find that a Chevrolet truck gives you *so much* to save with! Your Chevrolet dealer is waiting to fill you in on all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Biggest sellers . . . because they're biggest savers! CHEVROLET

CHEVROLET TASK·FORCE 57 TRUCKS

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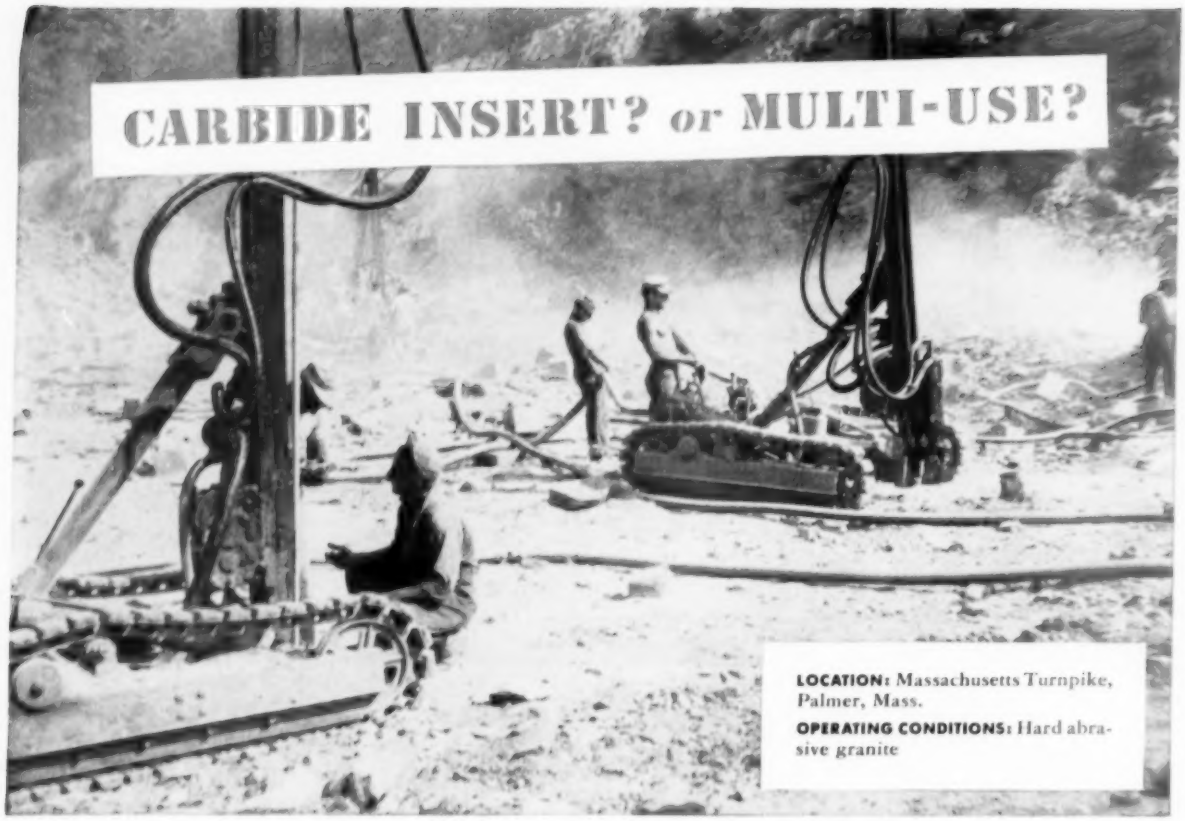

Grandview Construction Corporation speeds deep hole drilling on Mass. Turnpike with Timken® carbide insert bits

GRANDVIEW Construction Corporation had to drill extremely deep holes through hard abrasive granite on its sections of the 123-mile Massachusetts Turnpike. To get speediest drilling at the most economical cost, Grandview used Timken® carbide insert bits. They got maximum production, kept bit cost per foot-of-hole at rock bottom.

For economical drilling in hard, abrasive ground, Timken carbide insert bits are your best bet. But carbide bits may not be the best choice for *every* job.

In ordinary ground, you get more economical results with Timken multi-use bits. Correctly controlled and reconditioned, they give you lowest cost per foot-of-hole when you can drill out full increments of drill steel.

With Timken carbide insert and multi-use bits, your drillers save time. Dozens of different bits fit the *same* drill steel, let you switch bits fast as the ground changes. And both types of bits have a special shoulder union that protects threads against drilling impact.

Timken rock bits are made from electric furnace Timken fine alloy steel. We're America's only rock bit manufacturer that makes its own steel.

For expert help on selecting the best bit type for your drilling jobs, write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

your best bet for the best bit ... for <u>every</u> job

TIMKEN

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HINTS AND HELPS

Profit-making ideas developed by operating men

Send Us YOUR Ideas

We would like to make this column better, and we can, with your help. In the past, we have depended upon our field editors almost exclusively for *Hint and Help* items. However, we feel that a wealth of material exists that only you can uncover. YOUR *Hint and Help* ideas, no matter how simple (in fact, the simpler the better) may interest other readers. For each idea accepted, you may receive either a cigarette lighter engraved with your name or $5.00. A photograph or rough drawing should accompany each item. Send ideas to:

Hint and Help Editor
ROCK PRODUCTS
79 West Monroe St.
Chicago 3, Ill.

Rock dust is an asset

SAVE THAT ROCK DUST! Crusher sand and dust from rock or gravel crushing operations formerly wasted is now a useful and valuable product for asphalt plants. The problem now is how to hang on to it while conveying into storage.

This western gravel plant stores rock dust in conical top silos with enclosed chutes. Since they spent money to produce the dust they felt that they could spend a little to keep it.

Speed control increases crusher output

AN OHIO CEMENT PRODUCER found that the wound rotor motor with step speed control driving the apron feeder ahead of his primary crusher either surged or underfed the crusher. To avoid problems, the operators usually set the speed of the feeder drive well below the capacity of the crusher.

To get more output, mill engineers replaced the wound rotor motor with an Ampli-Speed magnetic drive and an existing 20 hp. 1,750 rpm, squirrel cage motor. Now if the crusher becomes overloaded, the feeder is stopped until the crusher load returns to normal. Output speed of the unit is about 1,400 rpm. It is stepped down to drive feeder headshaft at 2 rpm.

The Ampli-Speed control is tied in with a current transformer on the crusher motor. When crusher motor draws more current (indicating an overload), increased output from the motor current transformer is rectified and fed to the Ampli-Speed control. This simulates a rise in output from the dc. tachometer-generator, a load speed indicator. To correct this *apparent* increase in load speed, the control circuit cuts off excitation to the magnet, stopping the drive.

The feeder stays off until crusher motor current returns to normal. It then starts up again. This intermittent operation of the feeder makes it possible to feed the crusher more smoothly and efficiently than could be done with continuous feeding. Overloading is minimized, and the continuous attention of an operator is not required.

Intercom system

A DREDGE OPERATION in the West delivers all material by trucks. Since the scale house is some distance from the plant office, communication between these two locations presented a problem. However, with the installation of

(Continued on page 86)

(Continued from preceding page)

an intercom system, adequate communications are maintained between the dredge, shore points, plant office and the scale house. The "squawk-box" shown in the lower right-hand corner of the illustration is one of the units in the system. The dragline is a Bucyrus Erie, 3-W electric unit and swings a 3-cu. yd. bucket.

Floating pipe line is mounted on oil drum rafts

BIG SETTLING PONDS are difficult to manage under the best of conditions, but this southern cement producer puts their screening plant tailings into the same pit they are digging raw materials out of. An 18-in. flexible pipe mounted on oil drum rafts helps them direct the effluent from washing and screening where it won't interfere with dredging operations.

Tandem trailer

AN EASTERN STONE PRODUCER "doubles-up" on his truck capacity with a tandem trailer dump body. The truck and the trailer each have a nominal capacity of about 17 tons, but can haul about 285 tph. of stone from the quarry to the primary crusher, a distance of about 1,200 ft. up a four percent grade.

Mobile welding unit

TIRED OF PULLING HEAVY WELDING equipment around the plant for on-the-spot repair jobs, maintenance crews of a midwestern industrial plant converted a battery-operated hand truck into a self-powered mobile welding unit.

They bolted a 450-amp. welding machine with control panel to the top of the motor case. Angle iron and sheet scrap were fabricated into brackets and rod holders to carry power cable, welding cable and an ample supply of welding rod.

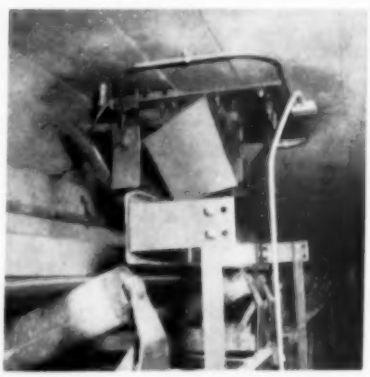
Movable sluice

WATER COLLECTING in storage bins over the scales can drip down on the scale platform and into the scale pit. To prevent this, one operator rigged up a counterweighted movable sluice with rollers mounted on tracks to carry off water. When a truck is in place for loading, the movable portion is pulled aside far enough to clear the spout over the truck.

Remote-controlled tunnel gates

WHERE TUNNEL GATES are remote-controlled, it is often a problem to avoid overloading belts or mixing materials on the belts by drawing materials from several openings at the same time. This can be avoided by the use of "tell-tale" fingers. These fingers are mounted on switches, which keep the gate above from opening as long as the material on the belt prevents the switch from completing the circuit to open the gate.

Incidentally, the belt here has a set of fixed skirt plates as well as a set of hinged skirts to make sure that material flowing out of the gate does not spill off the belt. Signal lights in the control house show the operator when the gates are open, and permit him to consistently control the flow of material to the reclaim belt.



Preventing belt flooding

WHEN FEEDERS AND BELT conveyors are out of sight in long reclaim tunnels there is the possibility that a feeder could flood a stopped belt before the operator could turn it off. This hazard can be overcome by the installation of a "zero speed" control switch on an idler shaft, or, as shown here (arrow) on the tail pulley shaft.

Then if the tail pulley does not turn because of a jammed belt, broken drive chain or for some other reason that does not stop the motor on the conveyor immediately, the switch cuts the power to the feeder. The control restores power to the feeder as soon as the tail pulley starts turning again.

END

WHY

Kensington Tracks

LAST SO LONG

There are two reasons why KENSINGTON tracks give longer service, even under the severest working conditions.

First, vastly improved design.

Second, they are made from a superior, wear-resisting alloyed manganese steel.

New design. KENSINGTON tracks have only three parts . . . the rail, the grouser, and the pin. Rails are cast in *one piece* to add strength and prevent wear caused by the constant twisting and weaving found in ordinary tracks.

Grousers have anti-shear lugs which fit snugly over the tie bar of the link to eliminate loose plates, elongated bolt holes, and side-sway. Grousers are heavied-up at all critical points to better resist bending and breaking.

Pins, constructed of a special alloy, are pressed tightly in place under high pressure to give further rigidity and near-perfect alignment.

Yet, even with all these design improvements, KENSINGTON track assemblies fit all standard, popular make crawler tractors.

Steel with stamina. Development of several remarkable wear-resisting alloyed manganese steels, including OHO Supermang and Kenkrome, has also increased the wear-ability of KENSINGTON tracks. These already-hard metals *actually fight back against wear!* They develop *extra* surface hardness when exposed to friction, abrasion, or impact. Yet, under this ever-hardening "skin," these metals stay tough and strong. That's why KENSINGTON uses Kenkrome in its rails and Supermang in its grousers.

Economical, too. Though KENSINGTON tracks cost slightly more than those supplied by the tractor manufacturer, they enable you to make substantial savings.

They give you many more hours of service per dollar of cost, less time lost for maintenance, and increased operating efficiency because KENSINGTON tracks keep their "pull-bracing grouser area" for a longer period of time. Also, you can maintain a smaller inventory of repair parts.

Discover for yourself how many hundred dollars these tracks will save you over the next few years.

Other wear-resisting KENSINGTON replacement parts

FOR TRACTORS

Kenkrome replacement rims for worn sprockets. Ready to weld on.

CRUSHER PARTS

Jaw plates, roll shells, mantles and bowl liners, hammers, grate bars and liners, etc.

FOR SHOVELS

Treads, rollers, racks, pinions and teeth . . . to fit all standard shovels.

CHAIN AND SPROCKETS

150 standard chains listed in new KENSINGTON Catalog plus many special chains. All of wear-defying Kenkrome.

Mail the coupon for further details on how much KENSINGTON tracks will save you in the "long pull."

Kensington STEEL

KENSINGTON STEEL, Dept. R, 505 Kensington Ave., Chicago 28, Ill.
DIVISION OF POOR & COMPANY, CHICAGO

Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of Tractor_____

Model_____ NO. TRACKS PER BELT_____ WIDTH OF GROUSER_____

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Enter 1293 on Reader Card

Tailings Go to Market - Separated by Sturtevant

10% WASTE SCREENINGS CLASSIFIED INTO PROFIT-MAKING PRODUCTS

Hills of bothersome tailings at a Mid-western rock-crushing plant are being classified into saleable products — agricultural limestone and sand for cement blocks — by a 10 ft. Sturtevant Air Separator. No extra men are needed to supervise the almost automatic unit — operating in rugged outdoor service. Screenings previously thought to have no commercial value are now going to market — **at a profit.**

THE SEPARATOR THAT UPPED 40 TO 400 MESH OUTPUT AS MUCH AS 300%

Sturtevant Air Separators range from 3 to 18 ft. in diameter: deliver fines from 40 to 400 mesh at rates as high as 65 tons per hour . ... in the cement industry, have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills.

Designed to cut costs and build profits, Sturtevant Air Separators give a lifetime of high-efficiency, low down-time service. Rugged construction plus easy accessibility for quick maintenance (typified by the "Open-Door" design in other Sturtevant equipment) assure more output per machine year.

Write today describing your problem. Please include information on material, process and desired capacity.

Address: Sturtevant Mill Company, 102 Clayton St., Boston 22, Mass.

What Can a Sturtevant Air Separator Do in Your Pulverizer System?

Controlled centrifugal whirl by balancing forces separates rapidly, efficiently, cement, lime, clay, talc, ceramics, refractories, phosphates, coal and many other materials. Also used for selection of pigments, limestone, fillers, plastics, oyster shells and abrasives. Write for Sturtevant Bulletin No. 087.

STURTEVANT

Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

Enter 1284 on Reader Card

By WILLIAM M. AVERY

Cement plant expands—twice within five years!

IT WAS NEWSWORTHY several years ago when Lehigh Portland Cement Co. first fired up its rotary kilns in a brand new wet-process plant at Bunnell, Fla. Now, in 1957, the event is still newsworthy because in less than five years Lehigh has completed two full-scale expansion programs which have more than doubled capacity.

Originally, it was hoped that the new plant would help relieve a critical cement shortage, but even with an anticipated capacity of about 1,400,000 bbl. annually the shortage still existed. Consequently, Lehigh's management started giving serious consideration to expanding the plant's capacity once again.

Actually the first expansion of the original two-kiln plant was begun in the summer of 1954 — several months before the mill was two years old. The No. 3 kiln installed under this program went in production in June 1955, and in August of the same year work was started on the installation of the fourth kiln. The latter was placed in operation in September 1956.

Thus, in its four-year operating history, the Bunnell property has been almost continuously subject to the stresses and strains which any construction program imposes on facilities and operating personnel. Despite this, the output of the kilns has consistently exceeded the capacity figures for which the original units were designed—varying from 2,200 to 2,400 bbl. per kiln per day, as compared with an initial goal of 2,000 bbl. per kiln per day.

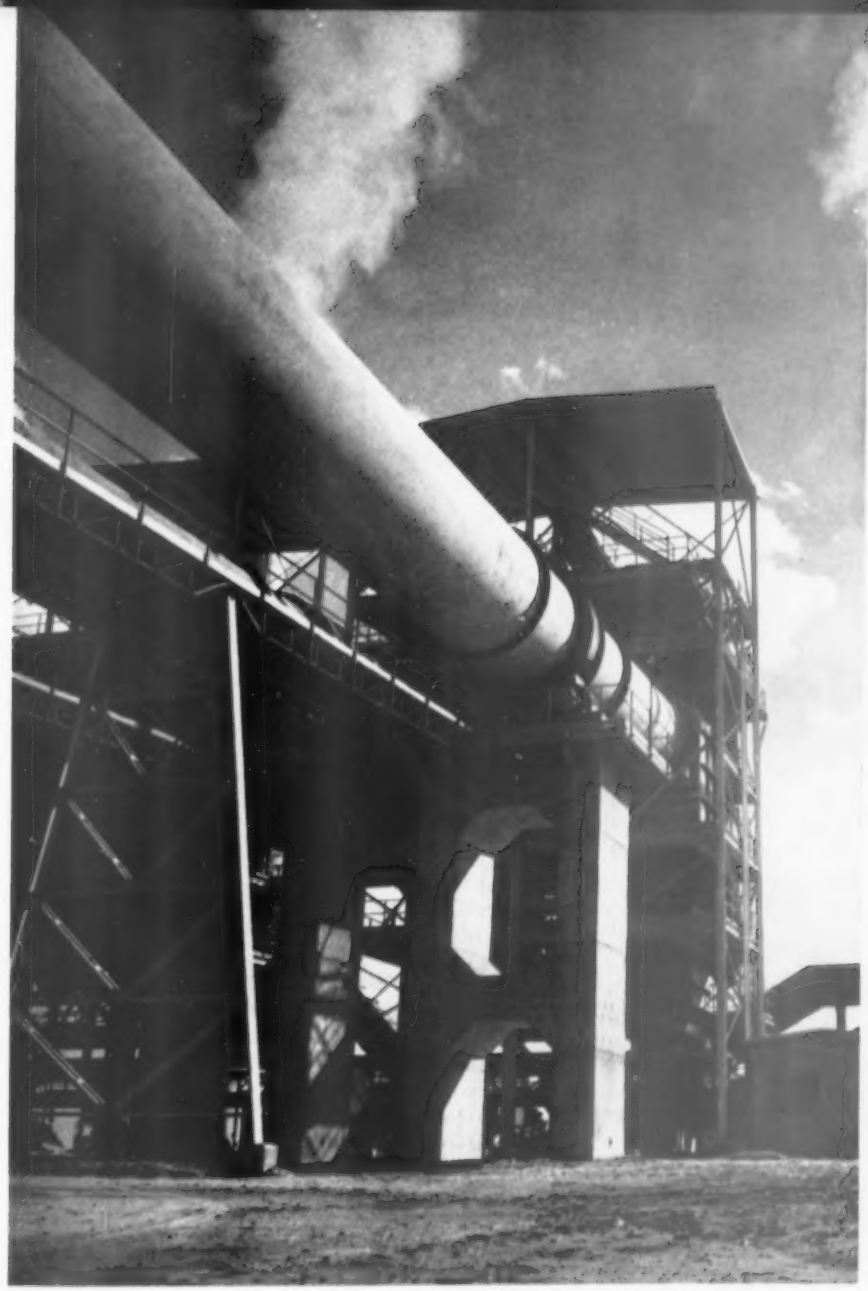
Process design and equipment selection for the original two-kiln installation have survived the intensive expansion program with only minor changes and exceptions. Even more significant, perhaps, is the fact that an excellent balance of productive capacity has been maintained throughout all the departments of the mill. This is all the more remarkable because the Bunnell plant is the first cement mill to use coquina shell fragments as the source of calcium carbonate.

The floating screen plant, one of the outstanding features of the original design, has come through the entire expansion program without any major alteration other than the addition of two units to the original battery of 12 finishing screens. Designed for easy maneuverability in the 200 to 300 ft. wide slips dug in the coquina deposit, the barge-mounted plant has been a complete success since the first day it was operated. Especially noteworthy is the fact that the screening plant was actually designed to supply enough shell in a normal quarry work week to operate two kilns. It actually proved to have far more capacity than the designers had dared to count on.

Excavation. With the stepped-up raw material requirements resulting from the firing up of the third kiln, and later of the fourth kiln, the excavation and screening operations were stepped up first to a two-shift and finally to a three-shift basis. The original walking dragline, which mounted a 10-cu. yd. bucket, has been replaced by a model 770-B Bucyrus-Monighan electric-powered machine mounting a 20-cu. yd. bucket. The new machine has a 195-ft. boom compared to the 165-ft. boom originally used on the first unit. Where stripping was formerly done by means of a dragline, this work is now handled by two Caterpillar DW-21 pans pushed by D-9 tractors.

Storage building. The two expansion programs made it necessary to increase the length of the combined clinker and raw material storage building. The original 96 ft. wide by 441 ft. long building was extended, adding a total of 315 ft. to its over-all length. The enlarged structure serves as the storage point for two grades of shell (a low-shell product is used to control the silica content of the raw mill feed); for staurolite residue, used as a source of Al_2O_3; for slag, used as a source of Fe_2O_3; for silica and gypsum; for dried shell used in masonry cement and for clinker.

Raw mill. The original raw mill at Bunnell was



Kiln feed towers

designed for both single stage closed circuit grinding and compartment mill open circuit grinding. The closed circuit grinding was conducted in three relatively short (15 ft.) ball mills in closed circuit with bowl-rake classifiers. Excess water was removed by use of a Dorr thickener. The open circuit grinding, used primarily for the grinding and proportioning of staurolite and iron slag, was conducted in a 7 x 36 ft. two-compartment mill.

The new mills are all 8 ft. 6 in. x 43 ft. two-compartment F. L. Smidth units driven through Symetro gear reducers by 1,250-hp. motors. Two of these mills operate entirely separate from the rest of the system, their product joining the product of the other mills at the correcting tanks.

In expanding the capacity of the raw mill no effort or expense has been spared to achieve maximum flexibility. For example, it is now possible to feed both shell and staurolite to the same mill, feeding the product of that mill in turn to one or two of the newer mills to obtain double or triple grinding. The 7 x 36-ft. Unidan mill which was part of the original installation can also now be used for almost any desired purpose in connection with raw grinding. Its primary function, however, is still to grind staurolite and iron slag. These ma-

One of the outstanding features of the original design is this floating screen plant

Cement plant expands

continued . . .

terials are now being fed with Schaffer Poidometers instead of with the feed tables originally installed.

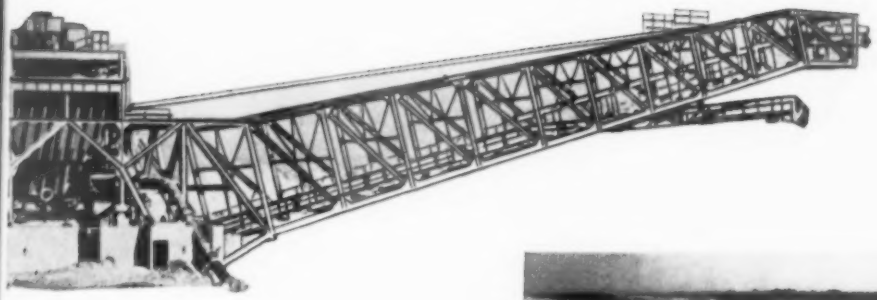
Slurry blending. No basic changes have been made in the arrangement or operation of the slurry blending and storage system, except to install the additional tanks necessitated by the increased capacity of the plant. Thus the four new slurry blending tanks are identical to the eight tanks in the original installation, just as the four new kiln feed tanks are identical to the two which were built with the original plant.

The 20 ft. diam. x 50 ft. high mixing tanks were originally piped so that slurry could be pumped from any one of these tanks to any other mixing tank, as well as to any kiln feed tank. In the expanded plant the present arrangement is such that slurry is pumped from any mixing tank to one of two large blending tanks and then to any one of the four kiln feed tanks.

Rotary kilns. Like the original units, the two new rotary kilns are 10 ft. 6 in. inside diameter and 380 ft. long. They were supplied by F. L. Smidth. The entire installation, including the coolers, is located above grade. These coolers (Fuller inclined-grate type) are about 4 ft. longer than those installed for the original kilns. This change (from 33 ft. to 37 ft.) was mainly necessitated by the fact that the kilns are actually producing up to 500 bbl. per day more than they were designed for, and this extra output has extended the capacity of the 33-ft. coolers.

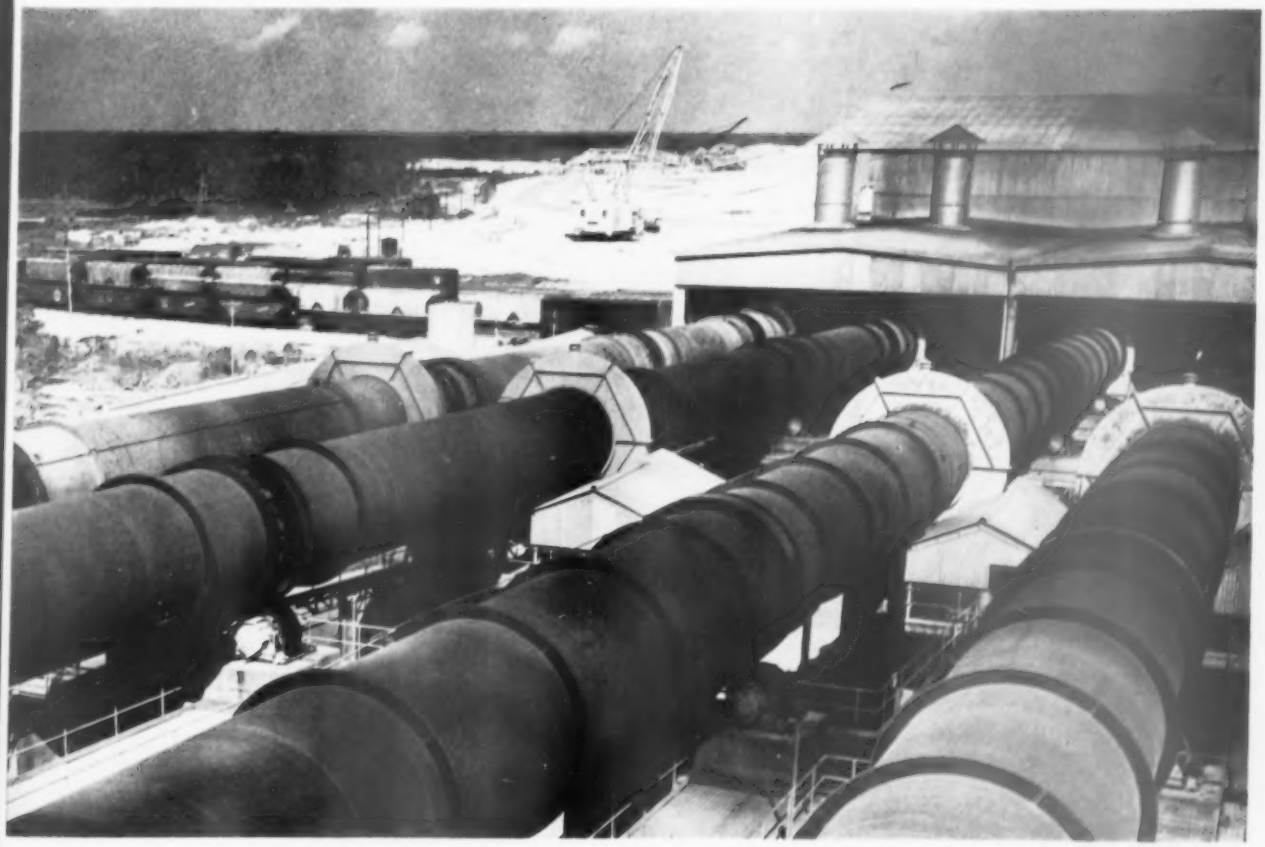
Drag conveyors still handle the clinker from the two original kilns, but the new installations include Carrier natural frequency conveyors. A dust collector system has also been installed to serve all the clinker conveyors.

Please turn to page 174



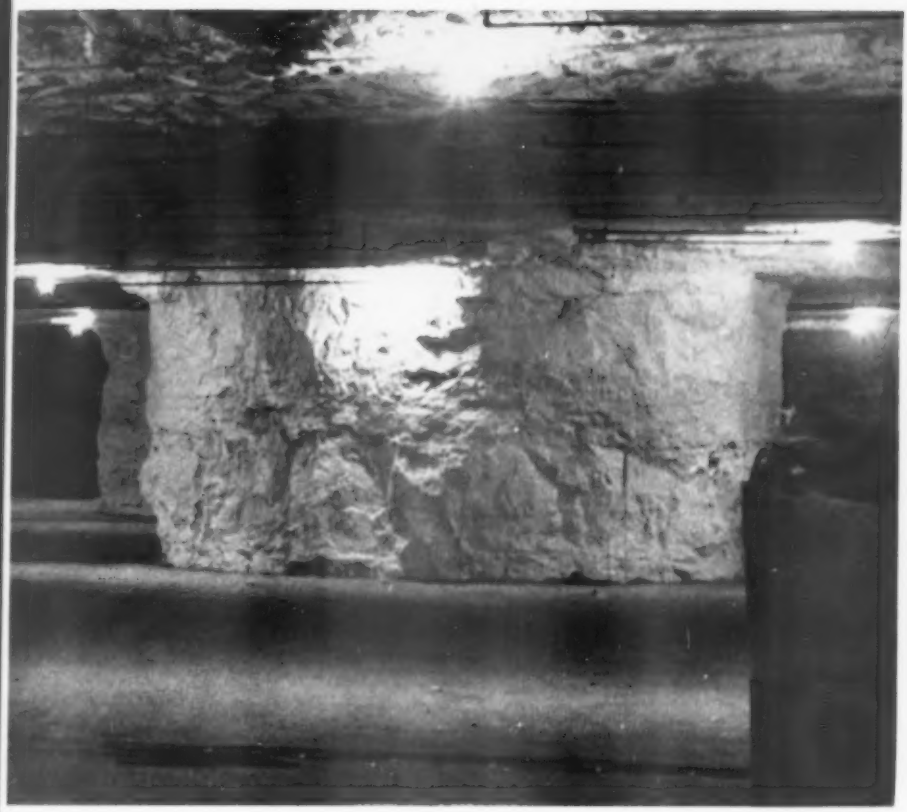
Kiln feed storage tanks

Looking toward the discharge end of the kilns. Quarry is shown in the background



limestone mine converted

Tier heights for stacking cartons or bales are limited only by ceiling height. Note steel fire doors at right and pipes of sprinkler system in ceiling



Interior view of a section of the underground storage area. Work of installing fire doors between sections of the Terminal had not been completed when this photograph was taken

to underground storage area

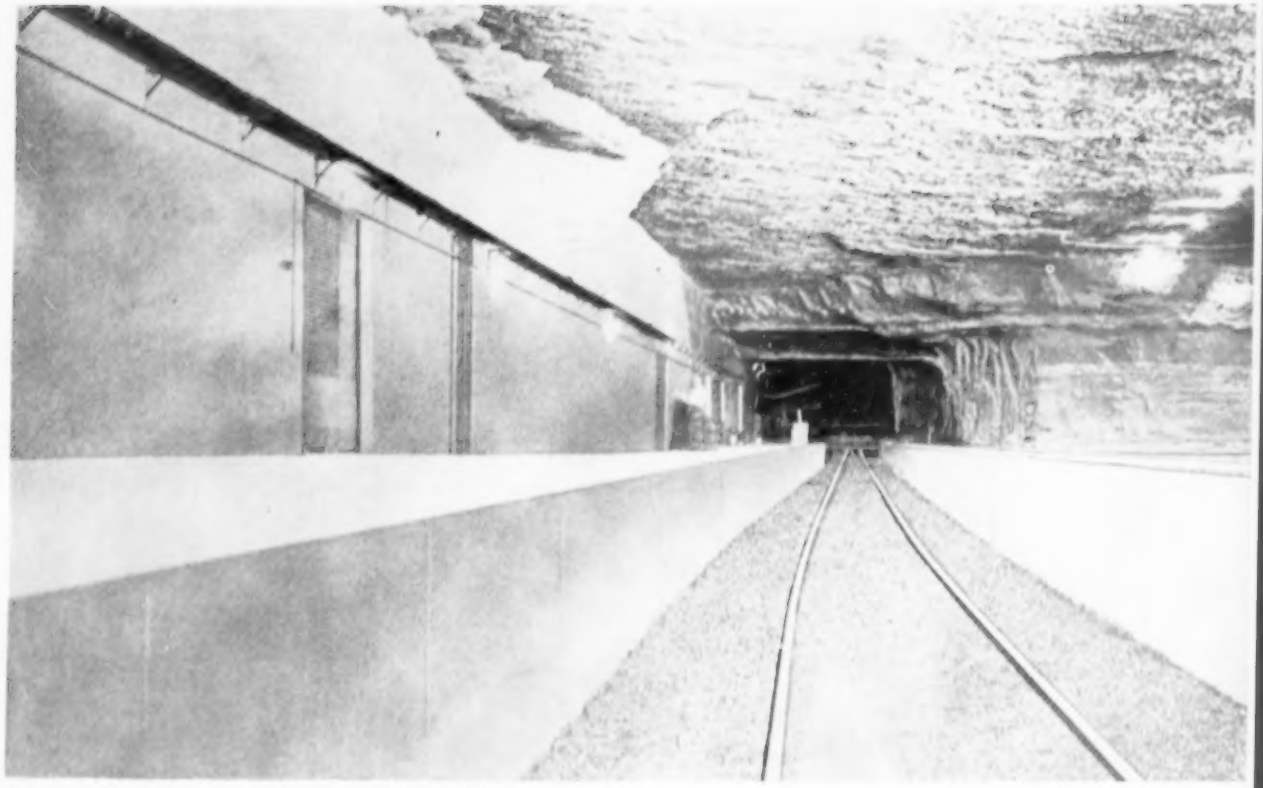
By HUBERT C. PERSONS

WORK A LIMESTONE DEPOSIT by mining or quarrying and you generally end up with an empty hole in the ground and whatever profit has accrued from the sale or use of the limestone. But Russell W. Hunt, president of the Southwest Lime Company of Neosho, Missouri, has demonstrated that a worked-out limestone mine can be an asset to the community and to the nation as an aid to national defense. His proof is 14 acres of dry, clean, bombproof storage space near Neosho, operated as Ozark Terminal, Inc.

The Ozark Terminal is no crude cave. It is a smoothly floored, well-lighted, modern storage warehouse. Although structurally it is fireproof, the goods which are stored in it are protected by an automatic sprinkler system. The nine different sections are divided by 8-in. cast-in-place concrete partitions. Unlike the usual warehouse, there is no limit to concentrated floor loads. Tier height of bales or crates is restricted only by the height of the ceiling, which varies from 20 to 30 ft.

Engineers who have explored the property believe that the overburden of limestone and flint rock affords complete protection against penetration by any bomb. They also believe that the warehouse, as presently laid out and equipped, is safe from radioactive fallout or gas attack.

Several departments of the Federal government, and especially the Business and Defense Services



Spur track and concrete loading platform inside Ozark Terminal. Track accommodates 15 freight cars

Underground storage

continued . . .

Administration of the Department of Commerce, are interested in sites for underground storage. The objective is to provide facilities for the safe storage of strategic materials — surplus foods, critical medical supplies, vital machine tools—and important business records and manufacturing formulas. William E. Haines, director of Industrial Defense, U. S. Department of Commerce, spoke in praise of firms who have made arrangements for underground storage facilities for records and as alternate headquarters.

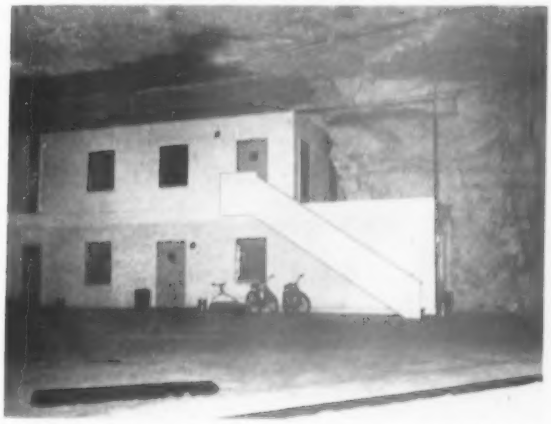
"These companies," Mr. Haines said, "have done an unusually imaginative and sound job of planning against a day which they hope will never come. They and many others have recognized that the threat of nuclear attack poses a business risk which, unlike many others, cannot be passed on to an underwriter. It is a risk for which they must be self-insured."

Mr. Hunt and his associates, aware of the scarcity of suitable underground space, organized Ozark Terminal, Inc., early in 1956. Mining of the area now occupied by the terminal was begun in 1942 to provide high calcium limestone for the plant of the Southwest Lime Co. Work of equipping the bare underground space for storage purposes and installing the essential utilities was started in April, 1956, under the direction of R. H. North, a general contractor who came from retirement to handle this special project. Pipe work and electrical wiring were done by Chester Hennick and Roy Rennick, contractors in those fields.

The first steps included leveling the floors, applying a surfacing of asphalt with limestone aggregate, and rounding and smoothing the rough pillars of solid rock, 25 to 40 ft. in diameter, left standing to support the roof. Another preliminary was the construction of 600 ft. of standard gauge railroad track depressed 4½ ft. below the general floor level, with broad concrete loading docks on both sides.

Although the temperature and humidity in the underground area tends to remain fairly constant the year around, humidity control recording units

Aerial view of entrances to Ozark Terminal. Spur railroad track entrance to Terminal is at right of center. Left of center is entrance to mine being worked by Southwest Lime Co.



Terminal offices occupy lower floor of this concrete building which is entirely underground

made by Desomatic Products, Inc., of Falls Church, Va., keep the relative humidity at close to 48 percent. These units employ silica gel, and are used in the various sections to maintain whatever degree of humidity is most desirable for the particular commodity being stored. The temperature stands between 60 and 65 deg. F. in all seasons.

To insure an adequate supply of water for the sprinkler system, a concrete-lined reservoir with a capacity of 104,000 gal. of water was constructed approximately 156 ft. above the storage area. A water line from the reservoir is carried through the solid limestone overburden to the sprinkler distribution system. An 855-ft. deep well is used and has a capacity of 150 gpm. Additional fire protection includes steel fire doors between the various sections of the storage area and steel doors at each of the four entrances.

A two-story concrete masonry building entirely inside the underground area is occupied by the offices of the terminal company and also provides office space for some of the companies whose products and commodities are being stored. In order to facilitate handling of materials, a number of Towmotor lift trucks of 4,000 and 6,000-lb. capacity are provided.

White paint has been applied to the ceiling and walls not only to insure cleanliness but to obtain as high a light reflection factor as possible. Thus far the installation of lighting and water systems and all the other refinements which have converted an artificial cave into a modern, controlled-atmosphere storage warehouse, have cost approximately $2.00 per square foot, according to Mr. Hunt. Future extensions of the underground warehouse may cost a bit less, engineers believe, since the most expensive pioneer work has already been done.

The Southwest Lime Co. is continuing to mine limestone from another part of the hill in which the warehouse is located. It is estimated that eventually 7 million sq. ft. of underground space will be made available for storage purposes.

END

Towering above the entire plant is the control house

Canyon

CRUSHED STONE IS THE MAIN PRODUCT of the profitable new gravel crushing and screening plant of Canyon Rock Processing Company. Their gravel pit is located in the alluvial discharge from Cucamonga Canyon near Upland, Calif., where the dry river bed is half a mile wide and the gravel deposit is hundreds of feet deep.

The crushing and screening plant, rated at 350 tph., was designed and fabricated by Pioneer Engineering for maximum efficiency. The natural sand and gravel is removed and the large gravel crushed and screened to sizes required in asphalt plants.

The plant can operate at top efficiency with six men during the day and five men during the night shift, according to Phillip Stahl, the plant superintendent. Much of this effectiveness is due to the

Overall view of the plant showing crushed stone being stockpiled at the left and natural sand and gravel at the right

Rock produces crushed stone from a gravel bed!

By ELWOOD MESCHTER

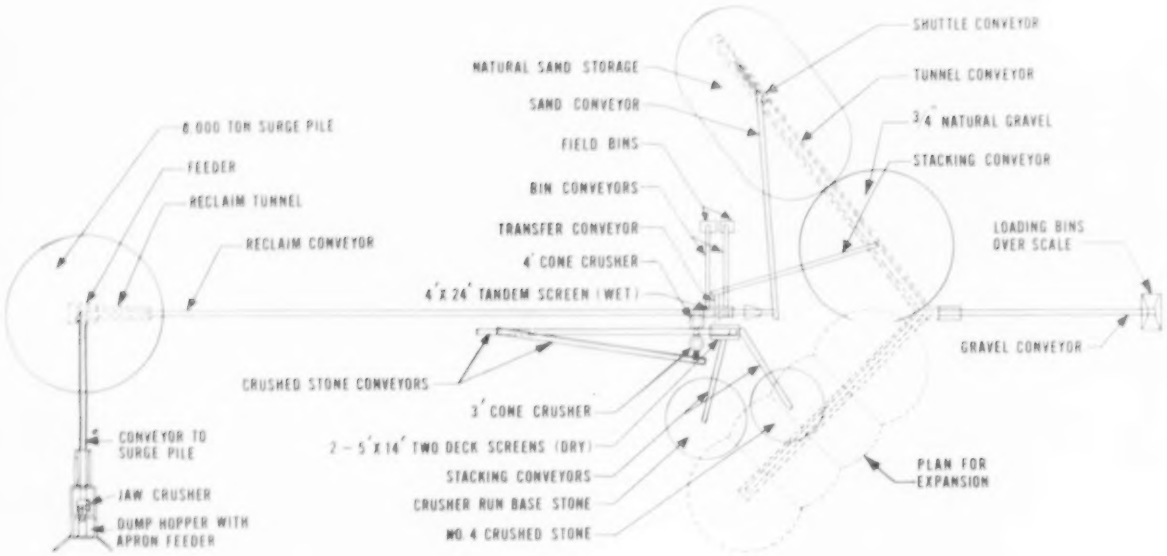
location of the main controls in a pulpit high above the whole operation. From this point the foreman can see every part of the crushing and screening plant and storage yards.

With all screen, feeder and conveyor controls at his finger tips, one man could operate the plant in an emergency as long as he had material in the surge pile or until storage piles were filled.

The primary crusher can handle up to 600 tph. of raw feed, which consists of about 60 percent 4 x 12-in. granite pebbles. When crushed, the blue-gray stone is coarse-grained, sharp and angular—ideal for use in bituminous mixes.

Gravel in the pit is well rounded and uniformly distributed, with occasional donikers between 2 and 5 ft. in diam. These are put aside to be used for dikes and roadways around the plant. The first cut in the pit by a Northwest shovel is 25 ft. deep, and after a few weeks of operation the pit is about an acre in size.

A 30 x 42-in. primary jaw crusher is fed by a 48-in. wide apron feeder under a concrete truck dump hopper. The feeder is protected from the impact of boulders up to 2-ft. in diam. by four steel beams in the throat of the hopper. The beams deflect the material to the sides of the hopper, allowing it to roll gently onto the feeder.



Crushed stone from gravel bed

continued . . .

View of the sand stacking conveyor and its traveling arrangement. A segment of the storage bin at the lower left contains a small-sized, washed gravel product

Crusher product is minus 4½ in. and this is taken to an 8,000-ton storage pile on an inclined belt conveyor. This conveyor, in common with other belt conveyors in the plant, is equipped with 4-in. diam. idler rolls with sealed bearings. All drives on belt conveyors have U. S. Motors and Dodge Mfg. Co. reduction units.

The conveyor from the surge pile to the screening plant is fed with a Syntron feeder, which is controlled from the tower. The operator can vary the rate of feed with a 12-point control panel.

First screening to remove natural sand and gravel is done on a 4 x 24-ft. "tandem" triple-deck screen. Water sprays wash the sand to an Eagle Iron Works sand classifier. Finished sand is taken to storage over a reclaim tunnel on a belt conveyor, while tailings are pumped to a settling pond.

Plus 1¾-in. gravel from the top deck of the screen is scalped off and chuted to a Nordberg 4-ft. cone crusher which reduces the gravel to 1½ in. The crusher delivers material to a belt conveyor system for delivery to the crushed stone screens.

The tandem arrangement of screens is simply two standard 4 x 12 ft. triple-deck screens mounted on one structural steel sub-base. This gives the advantage of 24 ft. of screening length, while retaining the flexibility and convenience of two standard screens.

Three sizes of natural gravel can be stored. Two belt conveyors carry pea gravel and ¾ x 1½-in. gravel to a stockpile over the reclaim tunnel.

This view, looking out from the top of the head house, shows the raw material pit in the far background, a truck dumping pit run gravel into the apron feeder and the concrete pit which houses a 30 x 42-in. jaw crusher at foot of the conveyor

The tandem screens can produce a wide variety of sizes, and the chutes under the screens are arranged to give an almost infinite selection of blended sizes to meet almost any specification.

Crushed stone is sized in a pair of 5 x 14-ft. double deck vibrating screens. Plus 1½-in. stone from the top deck of the top screen goes to a Nordberg 3-ft. shorthead cone crusher which reduces it to 1 in. The crusher drops this material to the same belt conveyor system that carries the product from the natural gravel crusher, building up a recirculating load of crushed stone.

Two belt conveyors handle the output of the screens. Stone from the second deck of the top screen is about 1 x ½ in. and this is blended with crushed sand to make one storage pile. Whenever needed, some middlings from the lower screen can be blended into this product.

The second product is a mixture of ½ x ⅜ in. and ⅜ x ¼ in. from which all crusher sand has been removed. This is stored with the second belt conveyor. Either or both of these sizes can be mixed back into the original product.

The chutes from the screens were designed to permit the addition of belt conveyors to stockpile more sizes or blends of material whenever the market demands them. The owners of the Canyon Rock Processing Co. hope to attract an asphalt-mix plant to this location in the near future.

The storage piles of crushed stone are stockpiled with a Caterpillar D8 bulldozer. Trucks are loaded with a Koehring Cruiser Crane.

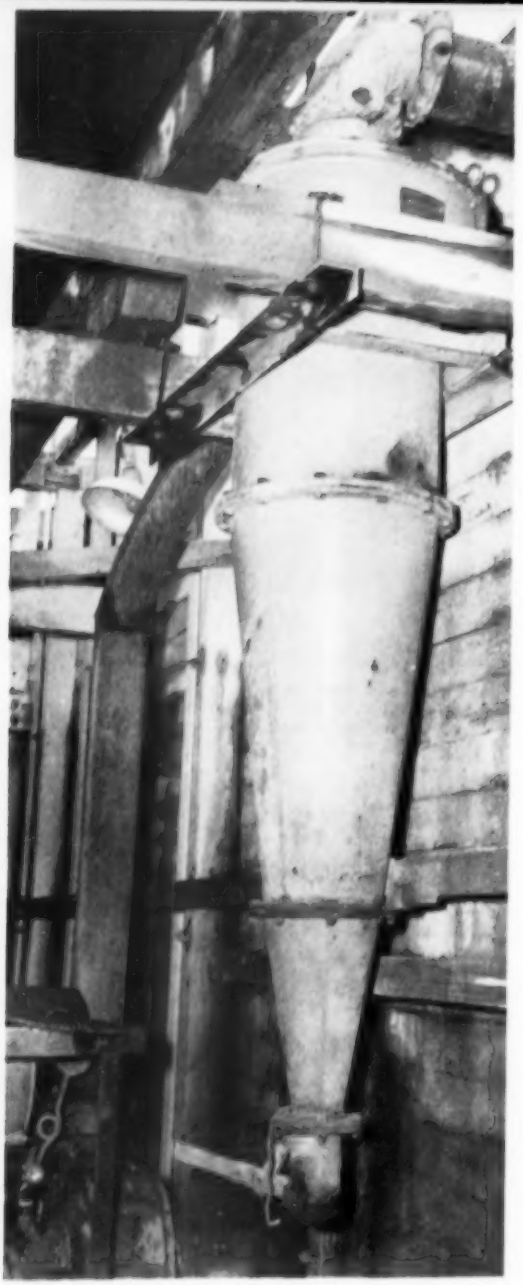
Natural sand and natural ⅜ x ¾-in. gravel are stored over a reclaim tunnel. Reclaim gates in the tunnel are pneumatically operated and remote controlled by Cliff Webster in the weigh house. He can select whichever gate will give the size needed in the shipping bins, while indicating lights show him which gates are open.

Each of the tunnel gates is equipped with telltale safety switches which prevent the gate mechanism from operating if the belt is loaded. Part of the gate mechanism is a set of skirt boards which lowers into place and directs the flow of material to the belt.

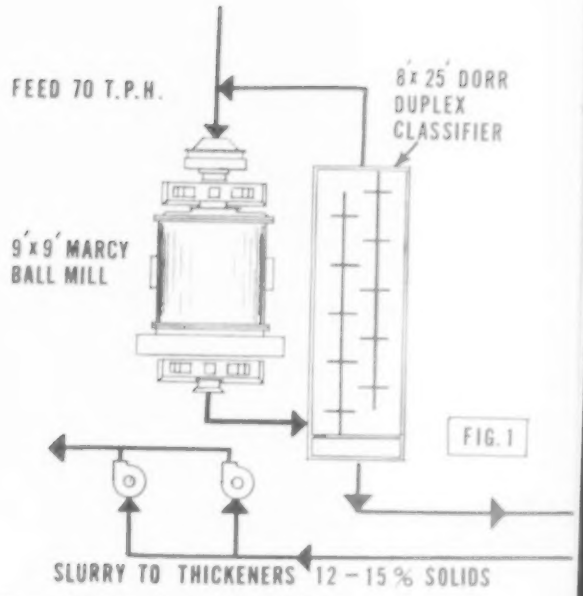
A reclaim belt in the tunnel discharges to an inclined belt conveyor carrying material to a five-compartment shipping bin. Each compartment can handle about 50 tons of material, and each is equipped with high-low bin controls. The high level control automatically stops the conveyor and closes the tunnel gate loading the conveyor. The low control shows the operator in the weigh house that there is not enough material in the bin to make a shipment.

The Howe Weightograph scale has a 70-ft. platform designed to handle the largest trucks in the Los Angeles area. All shipments over the scale are weighed and recorded rapidly under the direct control of the weighmaster.

END



A typical installation of a liquid cyclone



Conventional flowsheet without cyclones

If you spend a then lose it

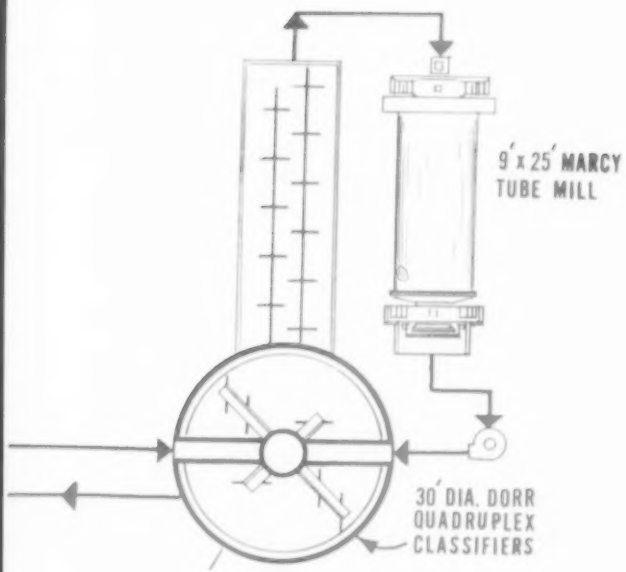
By JAMES T. CURRY*

ONE OF THE MANY PROBLEMS confronting the management of the Calaveras Cement Co. in 1955 was the prospect of having to handle larger volumes of finished slurry through existing pipe lines. They anticipated increase in pipe wear, as well as abnormal requirements of additional horsepower. The limitations imposed by the fixed capacities of the mechanical classifiers were another prime consideration to be given to continued plant expansion.

A hard look was given to the application of liquid cyclones as a means of processing the larger tonnage of finished slurry at higher densities. It was believed that a cyclone installation would replace the bowl classifiers, allow for a considerable increase in tonnage at essentially the same mesh of separation, permit pumping through pipe lines already in use and thus avoid large capital expenditures for the duplication of classifiers, pumps and pipe lines.

A single D-20-B Krebs Cyclone, manufactured by Equipment Engineers, Inc., of San Francisco, was installed on an experimental basis early in

*Plant metallurgist, Calaveras Cement Co. This article was originally presented as a paper by the author at the Pacific Southwest Industry Conference in Reno, Nevada, April 5-6, 1957. Published with the permission of A.I.M.M.E.



This idea can be applied to any industry where valuable fines are being lost

lot of money on fine grinding and in the wash water, why not consider

liquid cyclones?

1955. Although the pump installation feeding the test unit proved to be inadequate, data accumulated on cyclone performance indicated that the results demanded by plant operation could be achieved. Four additional D-20-B cyclones and four BC Frame Hydroseal pumps, rated to handle the required feed tonnage of 220 tons per hour were purchased.

Prior to the installation of cyclones at the Calaveras Cement Co., the raw mill grinding circuit was comprised of two parallel units.

- Primary grinding—classification designed to reduce the raw cement material to approximately 10 mesh in size.
- Secondary grinding and classification producing a finished slurry in the size range of 88 percent minus 200 mesh.

Primary grinding mills consisted of one 9 x 9 and one 8 x 7 Marcy ball mill, while both secondaries, or regrind units, were 9 x 25 Marcy tube mills. The general flow scheme for both circuits is illustrated in Fig. No. 1, with the bowl classifier product structures tabulated.

Mill feed, consisting of relatively coarse (minus 2 in.) crushed limestone and shale imposed a considerable load on the grinding units. Along with the limited capacity of the bowl classifiers, this served to limit production to about 70 tph. per unit. As a logical step in the direction of increasing production and lowering grinding costs, the size of the raw material was reduced by the installation of a 66-in. Telsmith Gyrasphere crusher operating in open circuit and delivering a product essentially minus 1 in. maximum to the raw feed storage.

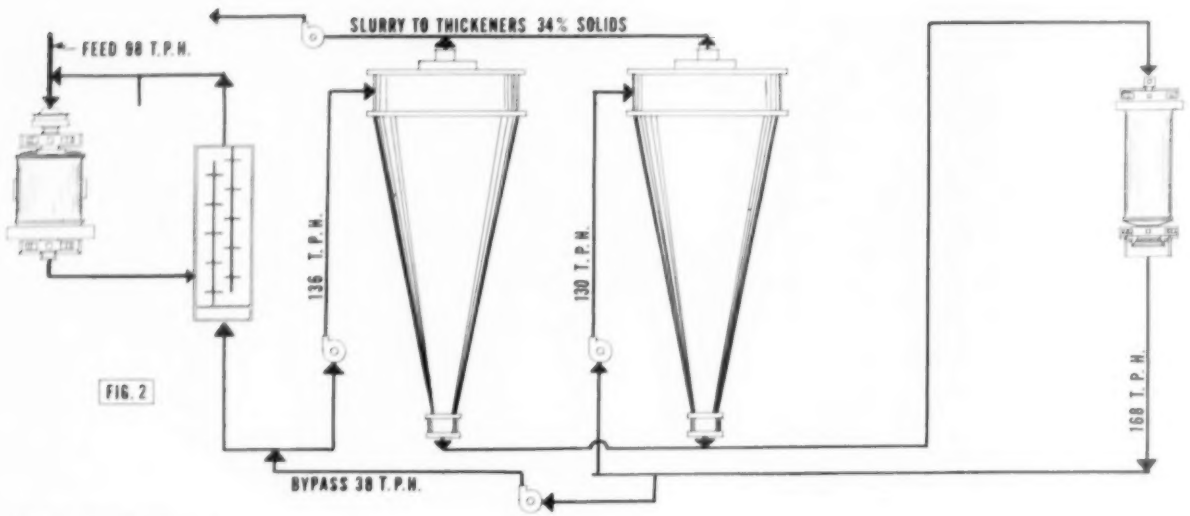


FIG. 2

Unit A cyclone flowsheet

Liquid cyclones

continued . . .

Table 1
Bowl Classifier Screen Structures

Mesh	Bowl Feed Percent Weight Direct	Bowl Feed Percent Weight Cum.	Bowl Sands Percent Weight Direct	Bowl Sands Percent Weight Cum.	Bowl Overflow Percent Weight Direct	Bowl Overflow Percent Weight Cum.
14	.21	.21	.32	.32		
20	1.22	1.43	2.70	3.02		
28	4.97	6.40	8.20	11.22		
35	6.36	12.76	15.12	26.34		
48	6.75	19.51	16.75	43.09		
65	6.10	25.61	15.12	58.21		
100	6.34	31.95	17.02	75.26	0.16	0.16
150	6.93	38.88	13.40	88.66	2.85	3.01
200	4.79	43.67	4.32	92.98	5.15	8.16
—200	56.33	100.11	7.02	100.00	91.84	100.00
			71.5% Solids		15% Solids	
	114 tph.		44.5 tph.		70 tph.	

The design of the initial cyclone installation on a production basis was engineered to take advantage of several features existing in the plant at the time. Launders and pipelines in place could be used advantageously, and the installation was completed with a minimum amount of shut-down time. Of importance was sufficient flexibility in operation so that the cyclones could be cut in or out of the circuit, as desired.

The operation of this original unit was considered satisfactory from a metallurgical standpoint. However, the operation of two cyclones in the same circuit with vastly different characteristics of feed particle size, dilution, tonnage and feed pressure requirements left much to be desired. To balance the load equally between the two cyclones, some secondary pumping was required to by-pass part of the load from one cyclone to the other.

The flowsheet in Fig. No. 2 was the result. While different conditions of feed pressure and orifice sizes still existed, a better distribution of the load was obtained between one cyclone operating open circuit, and the other operating in closed circuit with the 9 x 25 Marcy regrind mill.

Operating characteristics of the two cyclones in Unit A are given in Table No. 2. A comparison bowl classifier operation in Table No. 1 shows a decided increase in minus 200-mesh material in the cyclone underflow product. This minus 200-mesh material is normally considered finished product so that returning it to the 9 x 25 mill for further grinding is considered wasted effort, although it is sometimes argued that some minus 200-mesh material is useful to promote better regrinding by providing a more viscous mass inside the mill.

One of the inherent disadvantages of closed-circuit cyclone classification is the relative inefficiency, as compared to bowl classification. The problem of making a clean underflow separation of the fine or finished material can be remedied somewhat by the further addition of dilution water or an increase in feed entrance pressure. Neither of these are practical or desirable from an operational standpoint. The entrance pressure of 30 psi. at No. 2 cyclone was already exceeding the limits of economic pump operation, and it was felt that a further increase in feed dilution would defeat the purpose of providing a high density overflow product. Data was accumulated over a six month period on Unit A cyclone performance.

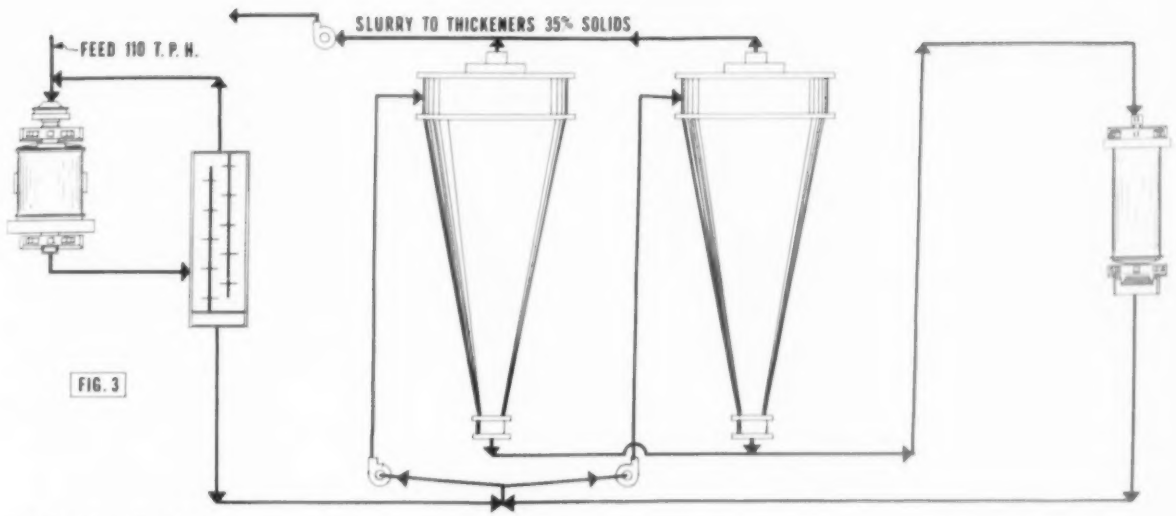


FIG. 3

Unit B cyclone flowsheet

When it came time to consider the installation of the second, or B unit, it was decided to incorporate the operational advantages of running two cyclones in parallel. This would relieve the problem of excessive fines in the cyclone underflow product. Accordingly, the necessary changes in plant design were incorporated with the installation of a new 9 x 9 Marcy ball mill. The benefits can be listed as:

1. Equal pump operation, wear characteristics and power requirements.
2. Even distribution of load and particle size between the two cyclones.
3. Equal cyclone operation, feed pressure requirements and wear characteristics.
4. Equal balance and distribution of cyclone products to thickeners and regrind.
5. Standardization of cyclone wearing parts, such as apex valves and vortex orifices.

Fig. No. 3 shows the flow scheme devised for applying the advantages of balanced cyclone operation to B grinding section. Preliminary screen analyses are tabulated on Table No. 3.

A comparison of the figures as tabulated in Table Nos. 2 and 3 show very similar results as far as the screen structures of the underflow and overflow products are concerned. However, the results are not directly comparable due to the fact that feed rates to the unit B cyclones were somewhat below normal during the sampling period represented by Table No. 3. The underflow solids of 71 percent reflect a low weight loading factor, resulting in a higher percentage of minus 200-mesh material than normal.

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Table 2 **Cyclone Data Unit A**

No. 1 Cyclone — Feed Inlet pressure 15 psi. — Vortex 6 in. Apex 3⅝ in.

Mesh	Feed (Calc.) % Wt. Direct	Feed (Calc.) % Wt. Cumulative	Overflow % Wt. Direct	Overflow % Wt. Cumulative	Underflow % Wt. Direct	Underflow % Wt. Cum.
—10 + 20	2.81	2.81			3.91	3.91
28	5.48	8.29			7.62	11.53
35	8.92	17.21			12.40	23.93
48	10.91	28.12			15.19	39.12
65	9.86	37.98			13.70	52.82
100	9.67	47.65	tr.	tr.	13.45	66.27
150	8.39	56.04	1.65	1.65	11.02	77.29
200	5.31	61.35	5.90	7.55	5.08	82.37
—200	38.65	100.00	92.45	100.00	17.63	100.00
Total	100.00		100.00		100.00	
	55.5%	Solids	33.7%	Solids	76.8%	Solids
	637	gpm.	357	gpm.	262	gpm.
	135.7	tph.	38.2	tph.	97.5	tph.

No. 2 Cyclone — Feed Inlet pressure 30 psi. — Vortex 5¼ in. Apex 2⅝ in.

Mesh	Feed (Calc.) % Wt. Direct	Feed (Calc.) % Wt. Cumulative	Overflow % Wt. Direct	Overflow % Wt. Cumulative	Underflow % Wt. Direct	Underflow % Wt. Cum.
—28 + 35	.41	.41			.76	.76
48	4.02	4.43			7.45	8.21
65	5.45	9.88			10.10	18.31
100	11.58	21.46	.30	.30	21.20	39.51
150	15.31	36.77	5.54	5.84	23.46	63.15
200	10.72	47.49	9.70	15.54	11.61	74.76
—200	52.51	100.00	84.46	100.00	25.24	100.00
Total	100.00		100.00		100.00	
	48.7%	Solids	34.4%	Solids	75.5%	Solids
	737.5	gpm.	542	gpm.	195.5	gpm.
	129.7	tph.	59.6	tph.	70.1	tph.

Composite Underflow

Mesh	To Thickeners % Weight Direct	To Thickeners % Weight Cumulative	To Regrind % Weight Direct	To Regrind % Weight Cum.
—10 + 65			38.40	38.40
100	.18	.18	16.69	55.09
150	4.02	4.20	16.30	71.39
200	8.21	12.41	7.81	79.20
—200	87.59	100.00	20.80	100.00
Total	100.00		100.00	
	34.1%	Solids	76.1%	Solids
	899	gpm.	457.5	gpm.
	97.8	tph.	167.6	tph.

This gigantic gyratory crusher is used for secondary crushing and can reduce 500 tons of rock to 3-in. size in an hour

Huge equipment and versatility are commonplace here

Rion Crush Stone services a variety of customers with some of the largest crushers and screens ever built

SOME OF THE LARGEST CRUSHING and screening equipment ever made is used by the Rion Crush Stone Corp. of Fairfield County, S. C., to produce crushed granite for railroad ballast, rip rap, filter stone, road stone concrete and asphalt aggregate and Ri-Stone poultry grit. The firm also operates an asphalt plant using crushed granite and granite screenings.

The primary crusher is a 66 x 86-in. Traylor jaw crusher, the largest machine of its type ever built. Operating at maximum capacity, this crusher could reduce to minus 10-in. size a 15-ton load of quarry rock every three minutes if the stone could be fed that fast.

The quarry, which occupies two-thirds of Rion's 30-acre holdings, lies within a 5,000-acre track which geologists say is underlaid with a mile-deep granite deposit. The stone quarried by Rion is part of the same deposit from which Winnsboro blue granite is quarried by the parent company, the Winnsboro Granite Corp., an entirely separate operation.

Overburden varying from 10 to 20 ft. thick is stripped off with a Northwest $\frac{3}{4}$-yd. shovel and hauled to a spoil dump in 15-yd. Euclid rear dump trucks. The quarry pit is 120 ft. deep, and a 100-ft. face ranging from 500 to 1,200 ft. in width is being worked. Rock production in the quarry averages $3\frac{1}{2}$ to 4 tons per pound of explosives. Rocks left after a blast which are too large for loading on trucks are drilled with Ingersoll-Rand jack hammers and shattered with 40 percent dynamite cartridges.

A 15-ton load of granite about to be dumped into mouth of mammoth crusher will be crushed in 3 min.

Huge equipment

continued . . .

Two electric shovels, a Model 4160 Marion, 4-cu. yd. and a 4-yd. Model 100-B Bucyrus-Erie shovel are used to load quarry rock into Easton 10-yd. side dump trailers powered by Mack tractors with Cummins diesel engines. A fleet of six of these trucks are kept for hauling stone from the quarry to the primary crusher.

A 48-in. Goodrich belt conveyor, 210 ft. long, takes the stone from the big crusher to the secondary crusher, an Allis-Chalmers 12-K gyratory, which reduces the rock to minus 3 in. sizes. This secondary crusher has a rated capacity of 500 tph. The material is carried on a 42 in. x 200 ft. Manhattan belt conveyor to a 60-ton storage bin.

From there the material may be directed into one of two 4-ft. standard Symons cone crushers and reduced to minus 2-in. sizes, or it may by-pass the cone crushers and be diverted to a surge pile. This is directly over a reclaiming tunnel 125 ft. long x 9 ft. in diam., built of cast-in-place concrete. A belt conveyor in the reclaiming tunnel moves the material to the cone crushers as required.

The stone is carried from the cone crushers on a 36-in. belt to a 6 x 14-ft. scalper screen. This returns oversize material to the cone crusher for recrushing. The remaining stone is taken on a 36-in. belt conveyor 225 ft. long to one of a pair of 4 x 12-ft. triple-deck Low-Head screens where it is washed and graded into six sizes, from 2 in. down to ¼ in. Extreme fines are washed out by spray bars over the screens and discharged into a sump. A five-acre reservoir provides the 2,400 gpm. of water required for washing and other plant operations.

The graded stone is carried to a battery of storage bins with gates discharging on to a loading belt that takes the material to stockpiles, railway cars or to trucks. The loading belt also serves as a blending belt when gates from two or more bins are opened.

A 40-in. conveyor belt takes the rock from the primary crusher to the secondary crusher

Even the biggest trucks and shovels are dwarfed by the 120-ft. wall of the quarry

Shown at the left is a 6 x 14-ft. scalping screen

Huge equipment

continued . . .

Looking through the spokes of the drive pulley on the 66 x 86-in. jaw crusher, said to be the largest of its type in the world

An additional Symons cone crusher, a 3-ft. shorthead, has recently been installed to produce minus ½ in. stone for asphalt work.

The Ri-Stone poultry grit plant occupies a separate all-steel building. The operation is kept completely dust-free.

Crushed granite, in sizes from 1½ in. down, is the basic material for the manufacture of Ri-Stone poultry grit. This comes from the main plant by belt conveyor from a two-gate reclaiming tunnel. The stone goes to a 4 x 8-ft. double-deck screen. Here oversize stone is fed to a 2 ft. Symons cone crusher which reduces it to ⅜ in. This cone crusher discharges the stone to a Jeffrey bucket elevator which dumps it back on the double-deck screen. Material passing this screening is fed to another bucket elevator and passed over a battery of four 4 x 10-ft. single-deck screens. The screens, all made by Allis-Chalmers, are hooded or enclosed in dust-proof housing and equipped with a suction device from a Sly dust collector. A suction device is also installed at each point where the crushed material changes direction of flow. One of the screens is equipped with Thermo-deck electric heating units.

The screens all feed into independent bins which in turn feed to a reclaiming belt that takes the different sizes of grit to the bagging machines. The grit is packed in 25, 50 and 80-lb. bags, weighed on automatic Toledo scales. Four sizes are sold: small for chicks, medium for broilers, coarse for hens and large for turkeys. Capacity of the poultry grit plant is 50 tph.

The Rion asphalt plant is a Barber-Greene Model 848 equipped with dual drum rotary dryers and a four bin gradation unit. The dryers are fed by a belt conveyor from stockpiles of screenings and ½ in. stone or whatever size is required for any special mix. Either hot or cold mix can be

Please turn to page 112

Part of the equipment used in the excavating operation at Pima Mine, Arizona. Operations will be completed about January, 1957.

STOODY HARD-FACING in one of the WORLD'S LARGEST OVERBURDEN STRIPPING PROJECTS

A huge stripping operation is in progress a few miles south of Tucson, Arizona, at the Pima Mine where Utah Construction Company is moving 6,000,000 cubic yards of overburden, including 600,000 yards of waste rock, to expose the copper ore deposit 210 feet below the surface. The job was begun in October of 1955 and will probably be completed by January of 1957.

An unusual feature of this project is the method of moving the overburden, a highly abrasive alluvial soil. Instead of the usual blast hole equipment, shovels and dump trucks, the job is primarily handled with rippers and scrapers. After the rippers make a pass, scrapers pushed by crawlers pick up the loose material and haul it to a fill. The equipment inventory includes a D9 Cat ripper, an HD21 A-C ripper, 10 MRS scrapers, two Cat 12 motor graders, six A-C and two D9 Cat pushers, four LLD 30-yard trucks, a Marion 7-yard shovel, a Michigan dozer and two water wagons.

One out of three shifts is devoted to maintenance and repairs. Hard-facing of many pieces of equipment is speeded up by the use of the semi-automatic welder applying Stoody 100. On ripper and bucket teeth which are subject to severest wear, Stoody Tube Borium is applied manually as a final overlay.

Hard-facing methods used here are described in the Stoody Guidebook and the folder on semi-automatic wires. See your Stoody dealer for a copy of this literature (check the yellow pages of your phone book) or write direct.

RIPPER TEETH—are hard-faced with two close, parallel beads of Stoody 100 across the point with an open-bead cross pattern up the tooth face. Points also receive a bead of Tube Borium on the under sides.

SHOVELS AND TEETH—at noon and at the end of the second shift tooth points are touched up with Tube Borium. Three stringer beads on the tooth are equivalent to a full inch of bare tooth wear. With this treatment teeth usually last six to eight shifts. Repointer bars are welded on worn teeth, hard-faced semi-automatically with Stoody 100 and finished off with Tube Borium.

SIDE BLADES ON LOADERS—are subject to severe wear from "scooping" action. Stoody 100 holds it in check.

STOODY COMPANY
11929 East Slauson Avenue,
Whittier, California

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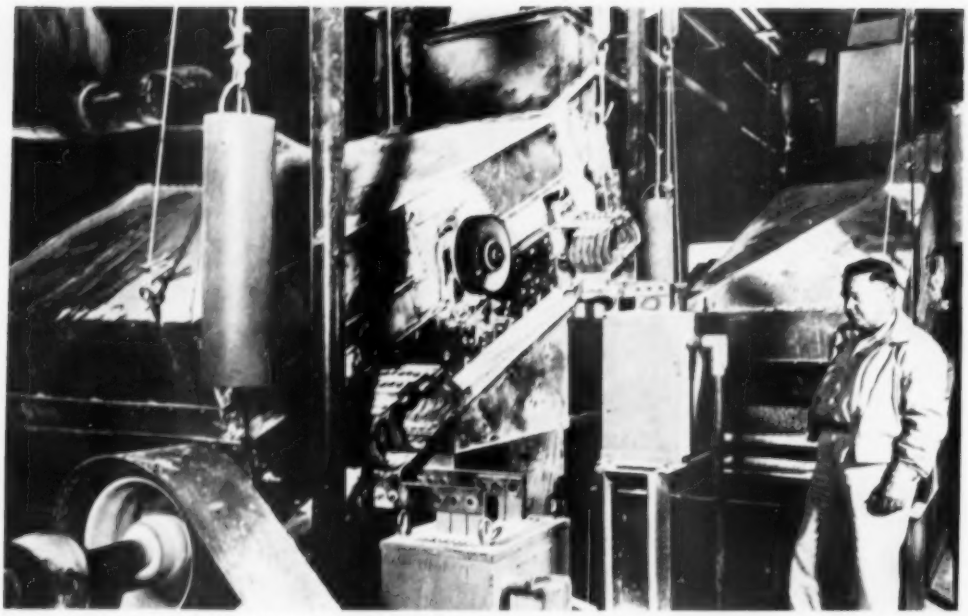

This screen, one of a series of screens in the poultry grit plant, is equipped with electric heating unit

Huge equipment

continued . . .

The poultry grit, bagged and ready for shipment, is stored in this quonset-type warehouse

produced to meet any specification for asphaltic concrete, binder, wheet or sand asphalt. Plant capacity is 200 tph.

Rion asphalt cold mix is stockpiled in the yards and remains usable for many days. Clamshells are used for stockpiling the cold mix and loading trucks.

The various departments of the Rion Corporation's main plant use 11 Northwest $\frac{3}{4}$-yd. cranes all equipped with International UD-18A diesel motors for stockpiling crushed granite and reloading into rail cars and trucks. The plant has 12 Mack diesel-powered trucks and four Studebakers. About one-third of the rock production is moved by motor truck. Truck deliveries to customers are made by contract haulers.

Major repairs to the Rion Corporation's heavy equipment are made in the complete machine shop maintained by the parent company, Winnsboro Granite. This shop is equipped with large lathes and other machine tools and even performs repairs for the Rockton & Rion Railways.

William L. Coleman is general superintendent of operations and secretary of the corporation. John T. Heyward is president and treasurer. Mr. Heyward is also president of the Winnsboro Granite Corp.

END

There's MORE

from Allis-Chalmers...

Dependable POWER

for Ore and Rock Processing

Apply the many cost-saving features of Allis-Chalmers deep rib motor in a variety of processes . . . both indoors and out.

Here's why these motors offer more dependability in quarrying and mining operations:

MORE Cooling Surface — Rib-type design provides reserve cooling capacity—an important factor in dirty locations.

MORE Iron — Cast-iron frame and external parts assure greater rigidity and resistance to corrosion.

MORE Copper — Greater use of copper increases electrical life.

MORE Lubrication Provisions — Large grease reservoirs surround bearings. Provision made for in-service lubrication — important where moisture or corrosive vapors contaminate grease.

Rib-Type MOTORS 1 to 100 hp

Allis-Chalmers offers rib construction in all enclosed motors from 1 to 100 hp (through frame 505). To find out more about A-C motors, contact your nearby A-C distributor or district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5271

PEAK CAPACITY

with

KENNEDY EQUIPMENT

NEW BRAUNFELS, TEXAS,
LIME PLANT
UNITED STATES GYPSUM
COMPANY

General View of Plant Showing KVS 10′ x 150′ Kiln with Preheater Internal Recuperator and Preheater

KENNEDY PRODUCTS

- Gyratory Crushers
- Swing Jaw Crushers
- Tube Mills
- Ball & Rod Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Coolers, Dryers
- Preheaters, Deheaters
- Belts, Conveyors
- Pneumatic Transport Systems
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Steam Generators
- Complete Aggregate Processing Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems

Send for bulletin describing KVS Machinery and Equipment

KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

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OF LIME PER DAY

...for New Braunfels, Texas plant of United States Gypsum Company

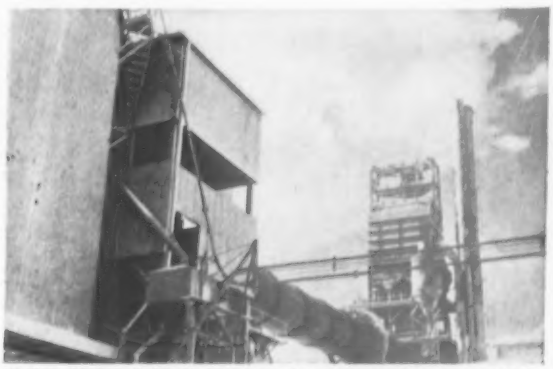
LIME PLANT PRODUCTION BEYOND RATED CAPACITY

One of America's largest lime producers, United States Gypsum Company chose KVS design and equipment for their new plant at New Braunfels, Texas.

Machinery and equipment designed and furnished by KVS includes crushers, screens, conveyors, kilns, preheaters, deheaters. The installation also provides the latest automatic controls and special equipment that permits high temperature "aging lime" — important in achieving highest quality. Also, storage capacity at this plant has been almost tripled.

Whether your plant is large or small, old or new, Kennedy has the machinery and equipment for better products at lower cost. Let us prove . . . with operating facts . . . why KVS machinery is your best buy. Engineering consultation, anywhere, any time.

UNITED STATES GYPSUM CO., NEW BRAUNFELS, TEXAS — STONE PREPARATION PLANT COMPRISING KENNEDY 37½ S GEARLESS CRUSHER, KENNEDY AAA VIBRATING SCREEN AND KENNEDY BELT CONVEYORS



UNITED STATES GYPSUM CO., NEW BRAUNFELS, TEXAS — CLOSE-UP VIEW SHOWING INSTALLATION DETAILS OF KVS 10′ x 150′ ROTARY KILN, PREHEATER, RECUPERATOR AND DEHEATER

UNITED STATES GYPSUM CO., NEW BRAUNFELS, TEXAS — OVERALL VIEW OF STOCKPILE SHOWING OPERATION AND ARRANGEMENT OF CONVEYORS

Enter 1288 on Reader Card

Artwork : Courtesy Hewitt-Robins

tackled by a conveyor belt system

Hewitt-Robins has specified Enka High Tenacity Rayon in a 1.8 mile conveyor belt system designed for Southern Pacific. Enka High Tenacity Rayon is helping to move 90,000 tons of gravel a day. Enka Rayon brings to this job exceptional strength and durability combined with flexibility, plus outstanding resilience and tension and abrasion resistance.

This means that by specifying Enka High Tenacity Rayon in your conveyor belts you get the above advantages and you get them at lower cost. Call or write for further information.

Enter 1289 on Reader Card

Here's a sand plant using

By WALTER B. LENHART

High pressure spray tears down matrix of sand bank

HYDRAULIC MINING TECHNIQUES are being used with excellent success at the Olympia Sand Division of the Central Supply Co., Watsonville, Calif. The new operation, at Felton in the Monterey Bay area, might be called a sand manufacturing plant: it takes the matrix apart and recombines it to manufacture or blend a sand to meet rigid specifications.

The topography at Felton is rough and rugged, with comparatively high mountains dominating the section. The general area is locally referred to as "Olympia," where deep beds of sand act as caps for the higher hills. Over the years a large tonnage of commercial sand has been processed by other producers at Olympia and shipped over a wide area, even reaching the San Francisco-Oakland markets.

The Central Supply Co., a large producer of ready-mixed concrete and asphaltic mixtures, has plants and sales yards at Watsonville, Santa Cruz, Felton, Salinas, Marina, Pacific Grove, Alisal and Logan. An affiliate company is the Granite Rock Co., with a quarry at Logan, possibly the largest commercial crushed stone operation west of the Mississippi. The firm, at its several sales yards, carries a wide line of building materials and the product of the new sand plant will be marketed to federal, state and local builders, as well as to supply the firm's own needs.

The mountain-top deposit at Felton presents a face of sand that is about 200 ft. high and practically all of the material is minus $\frac{3}{8}$-in. The only overburden is brush and some small trees. The toe of the sand bank ranges from 160 to 275 ft. above the plant—an ideal situation for hydraulic mining of the deposit.

Water is pumped to the general area of the deposit by a two-stage, Fairbanks-Morse 6-in. pump that is powered with a 125-hp. motor. A second smaller pump of the same make is at the well, which is capable of supplying 350 gpm. around-the-clock. Rejects or tailings from the plant are impounded in two ponds that operate in series. About 1,000 gpm. of clear water from the lower pond is pumped to the deposit through an 8-in. pipe line, with some 10-in. pipe in service.

At the upper end of the line and at the two other locations spaced below, connections and valves are provided to serve the three company-made moni-

hydraulic mining methods

tors that are used. A length of 4-in. rubber hose connects the main line with each monitor. Since coarse sands are higher in the bank, with the use of three monitors some blending can be made in the pit. As the sand is loosely consolidated in the bank a surprisingly small amount of water (and pressure) is required to send it on its way to the plant.

The monitor attendant carries a pair of field glasses and by watching the plant's stacker belts he can get a rough idea as to production. The pit operator also uses a jeep for transportation. The steep, rutted roads are over very loose sand, but the jeep climbs the grades without trouble. The top monitor is in use most of the time with one of the two lower ones used as boosters or to get more fine sand.

The possibility of a variable percentage of sand in the pulp flowing to the plant, due to formation of sand bars in the trench and launder system, has been eliminated by using riffles in the main

A long steel flume (with riffles to even out the flow) delivers the pulp to the plant in background

Hydraulic mining methods

continued . . .

Primary screen between plant and hydraulic operations removes all material other than sand and discards it

launder. A. J. Oyster, mining engineer and general superintendent, who cooperated in the design of the plant and also built it, has had considerable experience in gold placer operations in the west.

The distance to the plant from the lower monitor is roughly 1,000 feet. Of this, 500 ft. is by flume, about 200 ft. is by pipe line and the balance is open trench at the high end. The flume, of steel plate, is 2 ft. wide and 1 ft. high. Angle-iron riffles have been welded to the bottom of the launder in a manner similar to that used in conventional placer mining. In addition, two strips of steel plate (one at each side) that have been placed parallel to the long axis of the launder protect the corners from excessive wear.

The turbulence provided by the riffles prevents bar formation in the launder, evens out the surges in pulp volume, gives ample time for adequate washing of the grains, and protects the bottom of the launder from excessive wear. The launder has a slope of $\frac{3}{4}$ in. per foot. It delivers to a single-deck 4 x 10-ft. W. S. Tyler Co. field or primary screen that scalps off and rejects any plus $\frac{3}{8}$-in. material. Only a small amount is rejected.

The minus $\frac{3}{8}$-in. material from the primary screen is picked up by a 6-in. Wilfley pump and via a 6-in. pipe line delivered to the scalper screen in the plant. This screen has eight-mesh openings.

A long steel flume (not shown) delivers to a primary screen to remove oversize. The minus pulp is picked up by a sand pump that delivers through pipe line in foreground to scalper screen in plant

The minus fraction flows to a 28-ft., eight-spigot Eagle Iron Works sizing tank which also acts as a water scalper. Each spigot has three outlets so a total of 24 cuts can be taken from the sizer. An automatic impeller control mechanism is located above and near spigot outlet. When sand in that section builds up to a predetermined load on the impeller, the electrical input to the impeller's small drive motor will increase. When resistance to the impeller has reached the predetermined load factor, the outlet valve to that spigot automatically opens, unloading some of the sand to

Please turn to page 122

Many Marions Have Worked This Quarry

Hard digging encountered at this large central Ohio stone quarry requires rugged, durable machines. The owner of the 6-yard 4161 pictured has relied on Marion shovels for high output and low maintenance ever since the company's first pit opened more than 40 years ago.

Swinging a 2-yard clamshell bucket on a 50-foot boom, this Marion 362 handles 2500 tons of sand per average nine-hour day. There's a Marion machine of the right size and type for every excavating or materials handling job.

CONSULT MARION MINING SPECIALISTS *for lowest costs on your property!*

MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

Sand is pumped to heart of separation plant through the overhead pipe at right

Hydraulic mining

continued . . .

one or more of the three parallel launders below. After the load has been reduced, the valve then closes. There are eight of the impeller mechanisms mounted in a straight line above the sizing tank.

The three parallel launders below the spigots are for coarse or concrete sand, for medium or plaster sand and for fine sand. Any combination of the 24 possible cuts can be sent, all or in part, to any of the three launders. Each launder delivers to an Eagle Iron Works dewatering spiral. All the spirals are singles; one 30 in. for the concrete sand and two 24-in. for the medium and fine sand. Two coarse fractions can also be blended to the system and are obtained from screening as follows: The plus $^1/_8$ in. from the Tyler scalper screen just ahead of the water-scalper-sizer falls to a small Eagle Iron Works coarse sand, screw-type scrubber that delivers to a small Bodinson bucket elevator. The elevator discharges to a 4 x 6-ft. Leahy vibrating screen, made by Diester Concentrator Co., that has a single deck and uses $^1/_4$-in. openings. The two sizes of coarse sand, $^1/_4$ x $^1/_8$ in. and $^1/_4$ x $^3/_8$ in. fall to individual 40-ton capacity Bodinson steel cylindrical bins under each of which is a belt-type feeder. The two sizes of screened sand can then be blended at the Eagle spirals into concrete sand, the plaster sand, or both, if desired. Overflow from the spiral washers is sent to the tailing pond.

The two coarser sizes of sand produced have 100-ft. radial stacker belts and the finished sand is ground stored. One of the radial units is a Barber-Greene and the other is from Conveyor Co. The third stacker is stationary. A Michigan front-end loader moves the sand into trucks. By the combination use of radial stackers, up to four separate grades of plaster or masons sand can be stocked. Concrete sand for any specification normally expected whether federal, state or local can be met. Future plans may include the production of specialty sand. Westinghouse motors are used throughout the plant.

Rail shipments can be made from a spur that is less than a mile from the plant. Paved roads serve it and the contiguous area. The plant has a designed capacity of 100 tph., and preliminary runs indicate that teh production goal can be met. The operation was designed cooperatively by the engineering staffs of the Bodinson Mfg. Co. and Central Supply Co. Mrs. M. E. Woolpert is president of the Central Supply Company. Bruce Woolpert, vice president, was in charge of the design of the plant and Herb Hershman is in charge of the operation.

END

Power TO MOVE A WORLD!

➔ America stands on the threshold of a golden age. The sinews of her dynamic economy are flexed as never before. Increased power for untold requirements will be needed . . . and *met* by the most dependable supply of low-cost energy—*Bituminous coal!*

Proven usable reserves in B&O territory contain billions of tons—*available for centuries to come.*

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You'll receive details on the most efficient, low-cost Bituminous coal for your particular requirements—
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Baltimore & Ohio Railroad

BITUMINOUS COALS FOR EVERY PURPOSE

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Same hours, same manpower, yet by changing loaders

INDIANA QUARRY QUADRUPLES PRODUCTION

With the same *number* of loaders, and virtually the same number of man-hours, May Sand & Gravel Company, Fort Wayne, has *quadrupled* production (and sales) over the past few years.

Key to their 750,000 ton yearly success story has been the three Michigan Tractor Shovels they brought in to replace a number of less mobile loading units.

Load 550 trucks with 4,500 tons

Accurate records, covering a two year period, show the three Michigans load from 300 to 550 trucks *every nine hour shift*. During peak days their output totals 4,500 tons —a per-unit per-hour average of 175 tons!

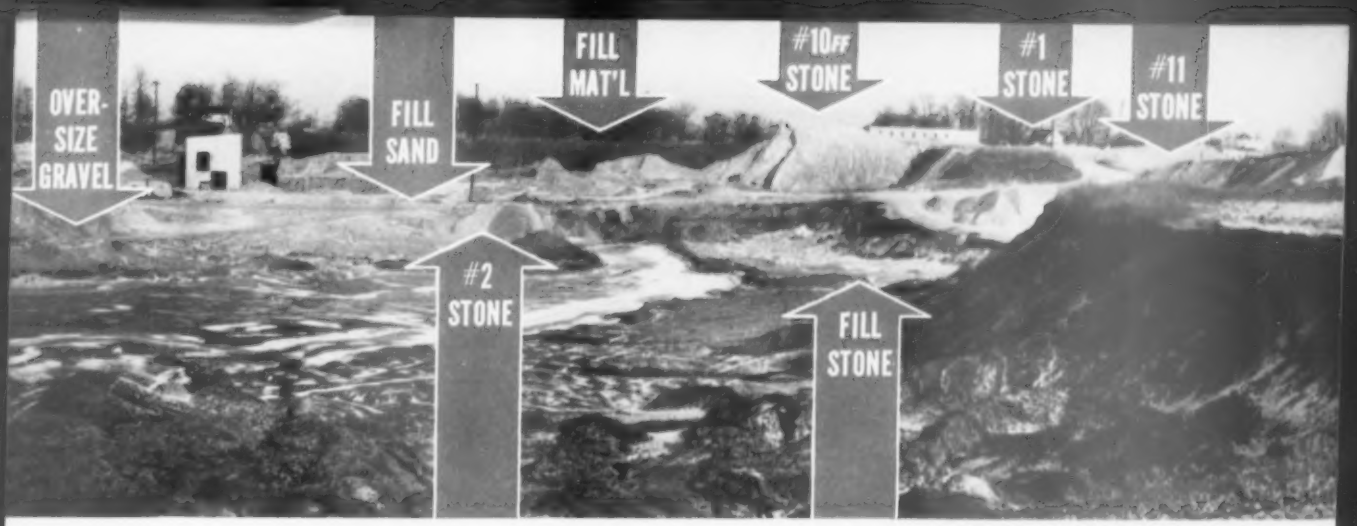
Truckers clear $25 more per day, end gripes

This excellent record has been compiled with only minor changes in methods. Trucks, for example, still are loaded in the order they come into the pit. Formerly, this practice caused frequent delays, often 20 to 40 minutes, while old-style loaders crawled between stockpiles, or labored to load the tougher materials. Now, *even on busiest days,* the Michigans work so fast no trucker waits longer than 2 to 10 minutes from time he drives into the yard until time he's loaded and pulls off the scales. "Trucker gripes have almost disappeared," says Company President Bill May. "The saving of 10 to 30 minutes in pit service often enables each truck to deliver another load or two a day when on long 15 mile hauls . . . an extra two to four loads a day when on shorter one to five mile hauls. That's an extra profit per truck of $5 to $25—or more—every day!"

Fast as trucks between stockpiles

Two major factors combine to produce this time saving. First, the mobile Michigans move from stockpile to stockpile just about as fast as the trucks. Second, the Michigans rapidly load all 10 sizes of stone, two types of gravel, and two grades of sand sold by this plant. Stopwatch measurements, taken from time to time during the past two years, show the 2¾ yard Michigans require only 1½ to 1¾ minutes to heap a 5 yd truck . . . 2¼ to 2½ minutes to load a 9 yarder.

Typical Michigan 2¾ yd load of #14 sand, heaviest of 14 materials handled, weighed out on company scales at 9,000 lbs.



Truck-like speed between stockpiles saves about 1¼ hours per day over crawler-loaders formerly used. Supt. Rooney estimates this time saving, plus lowered repairs, plus faster loading nets his company $70 extra profits per Michigan per shift.

Easy accessibility speeds maintenance

Another important factor in increased plant production has been *dependability*. May Sand and Gravel records show that *not once* in 5½ machine years has a Michigan missed more than a few hours of work. "Sure, we expect our rough service to take its toll," says Jim Rooney, Supt. "But we have a regular program of daily and 100 hour maintenance and inspection that catches what few troubles a Michigan has while they're small. Even when we spot something, even in the rare cases a Michigan breaks down, we always have the machine back to work the next morning! Easy accessibility, skilled workmen, and excellent distributor cooperation make repairs a simple job."

Also do such "extra jobs" as bank loading, pit cleanup

Speed and efficiency help out on extra jobs, too. Three hours every night, and sometimes during the day, one or two of the Michigans clean the quarry floor (this eliminates need for special tractor). Sometimes they load sand fill from bank direct into trucks. At times they level the gravel stockpiles. From 5 to 10 pm some evenings, two of them load non-blasted bank-run sand and gravel. Three trucks are kept busy hauling 2,000 ft to plant for processing. Only light source is own headlights. Average production: 230 tons per hour. And the Michigans have ended worries about rock shovel breakdowns. Supt Rooney reports production loading shot rock with a Michigan of 190 to 200 tons every hour.

Is it any wonder, with all-around performance like this, that May Sand & Gravel Company think Michigan "tops". We think, if you try one, you'll agree. Make your own test. Call or write to arrange a demonstration. You name the job!

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipestone Road
Benton Harbor 37, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

One of Michigan's "spare-time" jobs: hurrying to edge of 30 acre quarry to push off truck-dumped #1 stone.

Excellent service and cooperation from local distributor Deeds Equipment Company is one important reason for May's repeat purchases.

Wes Driscoll, left, and R. G. Canfield, Assistant Superintendent, discuss method of patching belt No. 2. Patches of slit in top cover are seen near the right edge of the belt

Conveyor belt maintenance

New cold patching method is tough and economical

A NEW METHOD OF COLD PATCHING the rubber covers of conveyor belts apparently makes the repair as tough and flexible as the original cover. This method is a chemical vulcanizing technique called REMA. Developed in West Germany, it was introduced into this country about three years ago.

With a few simple tools, patches and chemicals, any workman can readily make sound, strong repairs to a conveyor belt. Properly applied, the patch does not harden or peel off as the belt flexes around small diameter pulleys. The distributors of these self vulcanizing repair materials have added to the convenience of easy belt repairs by offering a compact "doctor's kit" which is readily carried or conveniently stored.

One of the first users in the Chicago area to prove the great value of the new repair material was Elmhurst-Chicago Stone Co. Their primary crusher in the floor of the quarry produces minus $7\frac{1}{2}$ in. limestone, which is carried to the secondary crusher at the rim of the pit on a pair of belt conveyors.

The belts of these conveyors are 5 x 7 step-ply 32-oz. duck 36 in. wide with $\frac{1}{4}$-in. rubber top cover — heavy belts to handle the large tonnage of sharp stone. When belt No. 2 snagged the skirt of the transfer chute, the rubber cover was slit from end to end. Ordinarily, even the toughest belt wounded in this way could last only a few months until moisture penetrated the duck and the impact of sharp material added to the cross-tensions in the carcass would split the belt lengthwise.

Please turn to page 130

Everytime a "95" Payhauler® leaves this shovel,

Camp Co. gets an extra 5 yds!

Day-to-day operational studies at Camp Concrete Rock Co., Brooksville, Fla., prove it! *Two International "95" Payhauler trucks, working with other haul units in the same capacity and power class, each carry an extra five yards every time they leave the 2½-yard shovel!* Loading time averages 2½ minutes for eight dippers or 20 yards. Haul length is approximately ¾ miles and includes a 10% adverse grade. The loaded Payhauler trucks travel this distance in 3 minutes, easily reaching load-carrying speeds of 34 mph. The empty return trip takes only 2 minutes, with the Payhauler trucks reaching top speeds of 38 mph.

Counting waiting, spotting time over the grizzly, and dumping time, the Payhauler trucks average a complete cycle approximately every ten minutes. During Camp Concrete Rock Co.'s nine hour day, *this means an impressive total bonus yardage of approximately 225 yards per day from each Payhauler*... an International-inspired saving of thousands of dollars yearly over Camp Co.'s other units.

You've probably read of similar outstanding International Payhauler successes in the rock, stone, and quarrying industries. Now try the amazing "95" and "65" Payhauler first hand. Test the safe and easy full-load maneuverability...the ample power of the 335 hp turbo-charged diesel engine in the "95," and 250 hp turbo-charged diesel engine in the "65." Check fuel consumption, too. See how you can bank *10%* savings, as well. Your International Construction Equipment Distributor will be glad to give you an eye-opening demonstration.

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers ...Crawler and Rubber-Tired Loaders...Off-Highway Haulers ...Diesel and Carbureted Engines...Motor Trucks...Farm Tractors and Equipment.

Give You "More Use per Dollar"

HOMOFLEX HOSE Handles Easiest Where Going is *Rough!*

Light in weight and "flexible as a rope" . . . strong enough to take a real beating on the job! Homoflex Hose is R/M's easy handling construction for use with air, water, other fluids and gases. No pre-set twist . . . it coils and uncoils in *any* direction—*without* kinking. Homogeneous cover, strength member and tube are virtually inseparable. Uniform inside and outside diameters make it easier to couple. Homoflex Hose gets more work done and lasts longer . . . gives you "More Use per Dollar."

Write for Bulletin #6879

RAY-MAN CONVEYOR BELT *Cuts Handling Costs!*

Cushioned strength members . . . *Double* compensation in top and bottom outer plies relieves stress in troughing, rounding pulleys and in reverse bends. Strength *plus* flexibility permits bigger loads, longer life . . . "More Use per Dollar." Ray-Man requires no breaker strip . . . resists ripping . . . *holds* fasteners . . . is mildew-proof and moisture resistant. Exclusive "XDC" Cover adds *extra* protection against wear, tears, cuts and abrasion. Other R/M feature conveyor belts include Homocord for abusive shock loading . . . R/M Tension-Master for extra long lifts, high tensions.

Write for Bulletin #6915

For the "Smoothest Running V-Belts Made," Specify CONDOR and R/M SUPER-POWER V-BELTS

RM-709

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

Enter 1382 on Reader Card

Actual patching of small cuts in the cover of belt No. 2

Wes Driscoll inspects his kit of tools and chemicals

Small patch in the cover of belt No. 2 is smooth, strong and flexible

Conveyor belt maintenance

continued from page 126

The maintenance group took a calculated risk in repairing the belt by the new method. They had used the chemical vulcanizing process on minor cuts successfully but had not expected to be able to perform major surgery. For a materials cost of about $425 for repair strips, $100 for metal fasteners and about $250 premium time over a weekend they patched the belt for its full 400 ft. length.

The assistant superintendent, R. G. Canfield, felt that the cost was worthwhile and remarked, "The belt should last at least two more years. Spending less than $1,000 to save a $7,000 belt was one of the best repair investments we have ever made." A careful inspection of the belt after several months of use and handling thousands of tons of stone shows not the slightest sign of wear.

The men who did the major repair job have developed a skill and a keen interest in using the repair materials to keep all the belts in the plant patched. Now at the end of each shift the belts are carefully inspected, and all cuts and tears are fixed immediately. There have been no major breaks in the belts and maintenance men now have only to double-check the work of belt men.

The REMA materials are highly effective on the rubber and Neoprene belt covers now used extensively in the rock products industries. Both nylon and rayon carcasses and most of the newly developed synthetic belt covers will require special treatment. However, by the time these are in common use, newer REMA patching materials may be developed.

REMA materials are easy to use and the directions are simple. Everyday cleanliness to eliminate water, grease or dirt from the patch area must be observed. Repairs can be made at any time of the year, but patches hold better if put on during dry weather. The manufacturers supply chemicals to help prepare the carcass and cover for patching. The materials are available from distributors across the country.

END

HAULS 4,000 TONS OF ROCK DAILY

Tournapull operator backs Rear-Dump up to edge of crusher, and flips electric hoist-switch. As body raises, rocks are dumped fast and safe. Body swings below and behind rear wheels, so rocks cannot obstruct wheels.

An abundant supply of base material was vital to Broce Construction Co., Dodge City, Kansas, when they began putting an 18" base on a 10-mile section of highway. Nelson Bros. Quarries, La Harpe, contracted to supply Broce with more than 400,000 tons of stone and sand for necessary base material. In order to maintain the continuously high rate of aggregate production needed, Nelson Bros. relied on their 3 high-speed, 22-ton LeTourneau-Westinghouse C Tournapull Rear-Dumps. These fast-stepping haulers high-balled material from pit to crushing plant . . . hauled 4,000 tons of blast-rock daily per machine.

Note big 22-ton rock load in heavy, welded-steel Tournapull Rear-Dump body. On this rugged pit job machines successfully withstood much of this hard pounding.

Average 22 tons of rock per load

At Nelson Bros.' quarry, 3 mi. northwest of Reading, C Rear-Dumps worked with 2½-yd. shovel. Their short 90° turn radius enabled operator to maneuver machines easily, and spot fast under dipper. Each L-W Rear-Dump was loaded with 22 tons of blast-rock in 1¼ min. Rear-Dump's wide 8'9" bowl, with low rear-entry, provided large, easy target area for shovel operator . . . reduced spillage and clean-up. Since shovel operator did not have to "lift" dipper high to get in and out of bowl, he saved valuable time on bucket's swing-cycle. This, plus time saved in hauling, maneuvering, and dumping, enabled Rear-Dump to make more round-trips . . . haul more tonnage per working-day.

Big brakes add safety on downhill hauls

'Pulls' multiple disc air brakes on all 4 wheels provided 3,762 sq. in. of braking surface for safe hauling on down-grades. At crusher, operator swung in fast . . . set rear-wheel brakes . . . and touched electric switch on control panel to activate hoist-motor and raise body. As bowl tilted, it swung discharge lip below and behind rear wheels . . . kept rocks from slipping underneath wheels as Rear-Dump fed load directly into crusher.

"These machines beat anything"

Supt. Carl A. Nelson reports his Tournapull haulers work profitably and efficiently. He said, "We have had excellent service from our Rear-Dumps. They haul from quarry pit to crusher, and have to take abuse on that type of work — but they are plenty rugged to take it." Nelson added, "They have plenty of power . . . can say we've had trouble-free service. We've worked all winter, in all kinds of weather. We can always depend on quick, easy starting on coldest days. These machines beat anything I've seen."

Heavy-duty haulers for tough jobs

For rugged, heavy-duty haulers to handle those tough jobs at your quarry, investigate the advantages of Tournapull Rear-Dumps. They take rough treatment . . . give you continuous high production. Call or write us for complete details.

Tournapull—Trademark Reg. U.S. Pat. Off. CB-1195 Q-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Overall view of Midwest Aggregates, Inc. plant

More and more customers pile up for expanded shale producer

block makers, precast plants take majority of orders

By G. H. K. SCHENCK

MORE PEOPLE IN INDIANA seem to want more lightweight aggregates. After only two years of production, there are still more customers than output at Midwest Aggregates, Inc., Indiana's only expanded shale producer.

This happy situation has caused a number of changes to step up production. A new clinker crusher is the latest addition to the plant which now has a capacity of over 160 tons per day of Midlite, the trade name for the product.

The two-kiln plant was designed by McNally-Pittsburg, designer of coal preparation plants, while Midwest Aggregates itself acted as contractor. The brick-lined kilns are run continuously, making $\frac{3}{8}$ x 3/16-in. and 3/16 x 0-in. aggregate. Production of Midlite is limited only by the capacity of the kilns and coolers. The kilns, cooler and stacker operate on a continuous schedule with three operators and one relief man. The rest of the plant is run on three shifts, six days a week, with shale preparation the only one-shift operation. Two foreman and 17 men are needed to run the plant.

Midlite is marketed throughout a wide area around the plant at Brooklyn, Ind., 30 miles southwest of Indianapolis. While block makers and precast plants take the majority of the output, Midlite is popular with architects, contractors and concrete producers. Its high thermal resistance and lightness makes it ideal for insulating structural steel.

Please turn to page 134

100% anti-friction drive

gives you bonus push-power... top efficiency

This Adams 550 boosts pit production . . . keeps haul-roads smoother . . . carves out new roads easier . . . opens snow-clogged routes earlier, than ordinary graders of similar size and power. It cleans-up around pit and plant fast . . . maintains better drainage. At every speed, Adams transmission, final-drive, and tandems deliver maximum engine-power to wheels, because all gears and shafts turn on ball- and roller-bearings. Control clutches, shafts and linkage also on anti-friction bearings.

Compared to other graders, Adams heavy-duty machines deliver a greater proportion of developed engine-power to tandem wheels. An Adams gives you this bonus work-power because all gears and shafts in transmission, final drive, and tandems turn on anti-friction bearings.

Push bigger loads . . . faster

Because the Adams' drive has roller- and ball-bearings throughout, very little of its horsepower is lost thru friction. More thrust is made available for pushing bigger loads . . . for blading deeper . . . for working faster. Furthermore, with an anti-friction drive, your graders' fuel-cost per unit of work done is correspondingly lower. Finally, longer bearing life cuts maintenance expense and downtime for repairs.

Transmission delivers maximum torque

The Adams transmission provides more power-speed combinations than other graders . . . 15 speeds . . . so you can do every grading operation at fastest practical rate. At each speed, transmission delivers maximum torque, because all gears and shafts turn on anti-friction bearings. It is fully constant-mesh . . . gears always engaged for fast, easy gear-shifts without clashing. Crown-shaved helical gears mate precisely . . . run continuously in oil . . . do not "howl" . . . give extra-long life.

Rear-Axle carries no weight

In heavy-duty Adams graders, 80 to 190 hp, the main rear axles are full-floating — they do *not* carry weight of the grader. Instead, rear-end weight is borne by sturdy axle carriers, consisting of two concentric, tubular-shaped, steel housings — one inside the other. Tandems oscillate at will on the two axle carriers. Grader keeps all four tandem wheels on the ground, even in roughest terrain . . . driving, pushing, working all-the-time.

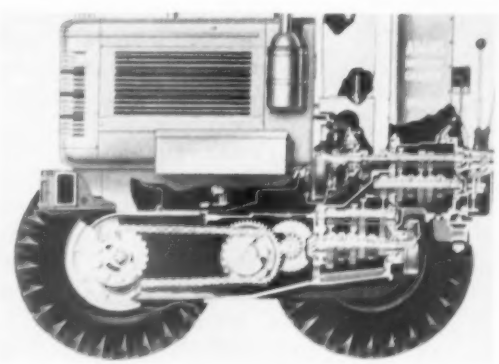
Inside the axle-carriers, driving-axles float "free", mounted in anti-friction bearings. They are fully protected from abnormal shocks and stresses of rough terrain . . . secure against breakage and undue wear.

Ask for demonstration

See how Adams' 15* speeds, with power delivered thru 100% anti-friction drive, give these machines *bonus* push-power . . . a capacity for work no other grader can match. Let us explain how an Adams saves you money on fuel and repairs . . . how it can keep producing for you week-in and week-out. 6 models, 60 to 190 hp. Choice of General Motors or Cummins diesel engines on 5 larger models. Call or write for all the facts.

**190 hp POWER-Flow 660 provides infinite number of power-speed combinations (to 27.4 mph) thru torque converter. 60 hp Model 220 has 9 speeds forward, with optional creeper gears . . . best in its class.*

Adams, POWER-Flow—Trademark AG-1231 M b



All gears and shafts in the Adams transmission turn on ball-, needle-, roller-, and tapered-roller-bearings.

Main rear axles are mounted on anti-friction bearings, and carry no grader weight. Instead, rear-end weight is supported on concentric, tubular axle carriers. Inner axle carriers are bolted to tandems; outer carriers to final drive housing. Thus, tandems can oscillate freely — without putting stress on main axles. 100% anti-friction drive increases available work-power, reduces operating costs.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

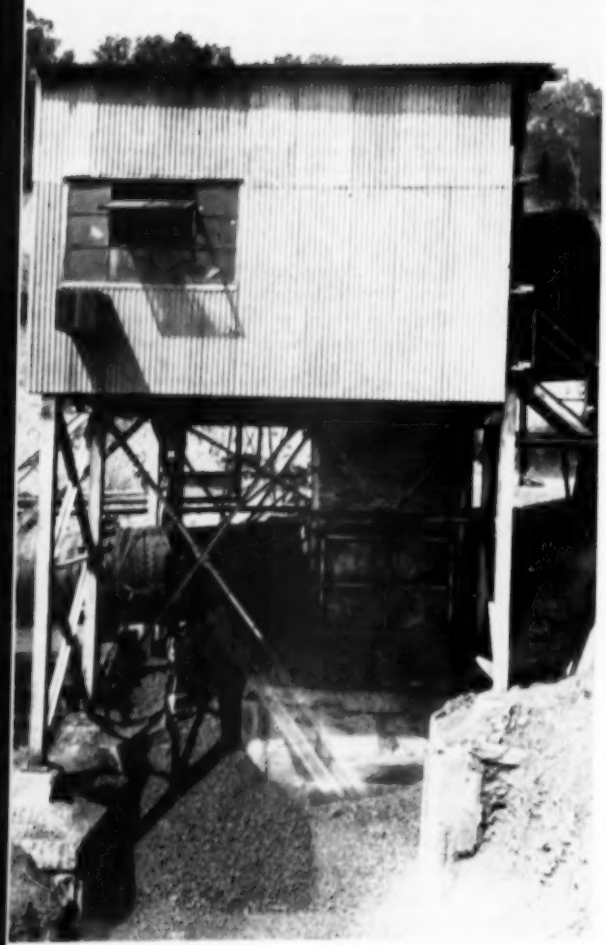
WHERE QUALITY IS A HABIT

Material travels downhill from the loading end at the right toward the fire house and clinker pit at the left

Expanded shale

continued . . .

Fire house and clinker pit



Raw material for the operation comes from the New Providence Shale of the Gorden Group. Reserves are so great that they constitute no problem, and other local manufacturers also get their raw material from the Gorden Group. The shale is blue-gray in color and so soft that it is possible to dig it from the pitface without drilling or blasting. Only a small amount of stripping is done since weathered shale produces good expanded aggregate. It is necessary to protect the stockpile because excess moisture turns the shale into a gummy mass that jams equipment and causes hang-up in the raw shale silos. Of course, any increased moisture reduces kiln efficiency.

After crushing to minus 2 in., the shale is stored in either of two 250-ton bins, one for each kiln. Jeffrey-Traylor weighing feeders feed the crushed shale successfully under all conditions except bin hang-up during the winter, a problem that has been solved by multiple openings under the bins. The feeders are moved as needed to maintain the flow of material. A flight conveyor under the feeder lifts raw shale and discharges it into a kiln.

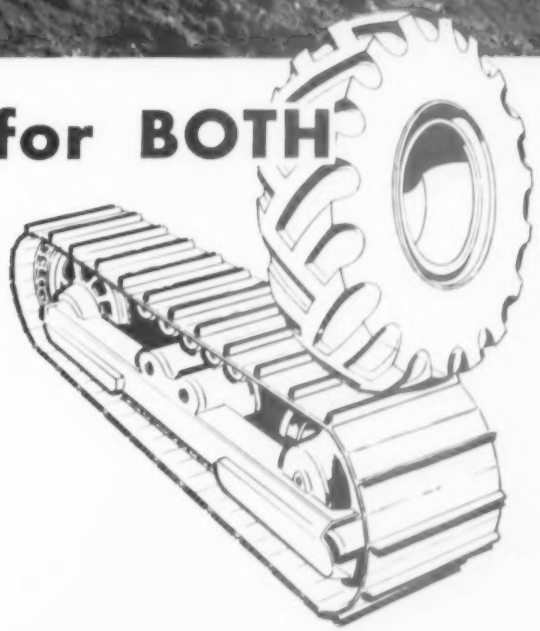
The kiln revolves at 4/10 rpm. with the temperature at the hot end kept at 2,300 deg. F. Natural gas is used for fuel and no provision has been made as yet for reuse of the hot waste gases.

Water injection at 110 psi. was tried experimentally when fuel oil was burned, and its use cut fuel consumption 8 to 10 percent. A capped pipe with an 80-mm. hole drilled in the cap was used to introduce vaporized water into the burning zone. This unit was mounted within a foot of the oil flame. The system might have been permanent if natural gas had not become available at a lower cost per Btu.

Lubrication of the trunnion bearings was a problem because the grease that was used picked up abrasive particles and acted as a lapping com-

Please turn to page 136

There's a place for BOTH



Work problems today demand modern equipment that can do specific jobs faster and at lower cost. Tournatractor is a modern tractor designed to take advantage of . . . *power, traction, speed* and *mobility.* It does not offer as much drawbar horsepower at speeds below 2 miles per hour as do track-type tractors of equal engine horsepower. But, if your job conditions are such that you can capitalize on *speed* and *mobility* — with a machine that delivers comparable traction at present day speeds, we suggest you consider the *new* LeTourneau-Westinghouse Tournatractor. The cost is 10% below that of track-type tractors with torque converters and comparable engine horsepower.

Before you buy — EVALUATE

1 — Your demands for power
2 — Requirements for traction
3 — Advantages of speed
4 — Need for mobility

After giving careful consideration to all of these factors when selecting a tractor, questions in regard to your specific application may still be in your mind. The best way to dispel all doubt about the qualifications of any tractor is to see it perform on your job.

We will be happy to arrange the demonstration of a Tournatractor on your job, to prove that this rubber-tired tractor has the *speed* and *mobility* that can pay off for you. Call or write today. No obligation!

Tournatractor—Trademark Reg. U.S. Pat. Off. CT-1145-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Rotary cooler and stacking conveyor. Boiler house is shown in the background

Expanded shale

continued from page 134

Aggregate crusher and storage. Reclaim tunnel will eventually replace the crane

pound. A. G. Mac Phee, superintendent, decided to try oil lubrication. Oil grooves were cut in the bearing and an oil reservoir was placed above it. Stanolith 169, a 1,700 viscosity oil with drip characteristics, is now used in place of grease. Gravity provides lubricant flow and abrasive particles are carried off by the flowing oil. An added advantage is the cooling effect of the oil since it dissipates heat better than grease. No bearing wear has been noticeable since this system was installed.

The clinker pit is constructed of ordinary brick lining with heat-resistant concrete made with Midlite. The same type of concrete is used as a 5-in. lining in the rotary cooler. A previous attempt to install this type of lining had failed because the expansion of contained water forced the cooler lining and shell apart. To prevent this, ¼-in. holes were drilled in the lining to aid drying. Midlite has now proven itself in both these jobs.

The cooler revolves at 2½ rpm. Its capacity has been increased by addition of a fine water spray about 5 ft. from discharge. An aluminum shed has been built over the cooler drive motor and belts, which reflects heat from the cooler.

The novel pivot point for the plant-built stacking conveyor is a "fifth wheel" from an old truck-tractor. This was mounted in concrete below the cool-end of the cooler and the stacking conveyor uses this point as a swivel.

Primary clinker crushing is done by a ring crusher, and following this, clinker is elevated to a two-deck screen. Oversize from the screen is recrushed by a roll crusher, while the finished products fall into a 125-ton divided-hopper bin.

The mixing of lightweight concrete made with Midlite is slightly different than mixing of regular concrete. It is for this reason the management has one of the company executives at any operation where Midlite is being used for the first time.

The expanded shale aggregate produced by Midwest has numerous pores created during expansion. When water is mixed with the aggregate, it is immediately absorbed in these pores and held tenaciously by capillary attraction. Water is added first. Standard mix ratios are used and the water literally disappears. When cement is added, balls are formed and the mix appears spoiled. However, as mixing continues, the cement, which combines chemically with the water, draws the water out of the pores of the aggregate. The mix gradually becomes plastic and has a slump about the same as a standard concrete of the same composition.

END

Why Falk Gears cost less per year of service

Experienced mill and kiln operators and engineers know that annual gear expense is determined by many factors besides the initial cost of the gears themselves. Among these factors are: tonnage handled, efficiency, and effect of gear operation on driving and driven machinery, shutdowns caused by gear failures or pinion replacements—and the service life of the gears.

By any, or all, of these standards, Falk Helical Gears are the most economical gears you can buy! They are *correctly designed, engineered and built* for highest accuracy, thanks to Falk's long and unmatched experience. All gears are *precision-hobbed* on machines designed and built by Falk. Each gear has a serial number; its pedigree is established during its course through the several shops and the many operations and tests to which it is subjected.

Repeated tests have proved that Falk Helical Gears have an efficiency of 98½% or greater—the highest obtainable!

These gears, with the smooth operation of their extra-capacity teeth, provide maximum resistance to abrasive wear—hence longer life, not only of the gears, but of driving and driven machinery. This means multiple savings for you.

Falk is the country's largest supplier of precision gearing...and has unsurpassed facilities to fill all your gear requirements.

Contact any Falk Representative—also, write for
Engineering Report 6170, "Advantages of Helical Gearing"

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 1, WIS.

FALK HOBBED GEARS FOR IMPORTANT CEMENT MILLS

The 2000 hp helical gear in the small photograph above is one of six destined to drive important cement mills, probably the largest mills built to date.

All Falk Helical Gears, both single and herringbone, are precision-hobbed on special Falk-built hobbers of highest accuracy. Falk gear hobbers have incorporated in the design of the gear train a mechanism which is extremely effective in reducing tooth-spacing errors to negligible values. The accuracy inherent in the machines has the salutary effect of insuring perfect load division between the several teeth that are simultaneously in contact in helical gears.

Finish hobbing is done in a room where the temperature is controlled within a variation of two degrees. This is a precaution against possible dimensional changes of the gear during the all-important finishing operation—changes which might affect ultimate accuracy.

FALK
...a good name in industry

No crusher damage on overload or tramp iron . . .

KUE-KEN® CRUSHER *has exclusive safety device that instantly releases flywheel*

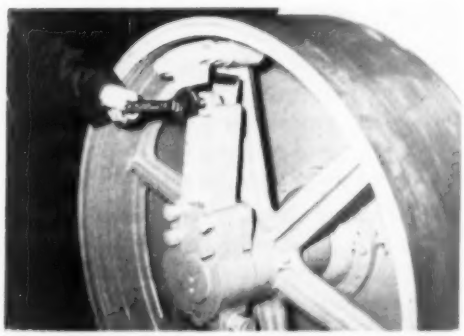
24" x 12" Kue-Ken crushing perlite

Kue-Ken has the one practical, efficient method to meet overloading and tramp iron . . . an automatic control that releases the flywheel and permits it to run free without ratcheting. Gone are the broken frames or toggles . . . the costly testimony to so-called safety toggles. Kue-Ken can be controlled to stop automatically on release of flywheel or to sound an alarm. Kue-Ken also eliminates the shut-downs common to conventional crushers that are caused by rapid wear through dirt and grit in the operating mechanism. Kue-Ken is the only crusher with a crankcase-type lubrication system that is sealed against outside grit with all mechanism operating in a bath of clean, filtered oil. In "crushing without rubbing" Kue-Ken gives at least 5 times longer jaw plate life. With higher operating speeds, it provides the capacity you need with a smaller, more inexpensive crusher. See chart.

Table of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position.

Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

Table is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed.



On correction of overload or tramp iron, the flywheel can be quickly reset and the Kue-Ken put back into operation without costly delays.

WRITE FOR CATALOG

KUE-KEN® CRUSHERS

"CRUSHING WITHOUT RUBBING"

STRAUB MFG. CO., INC., 8380 BALDWIN, OAKLAND 21, CALIF.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

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DENVER, COLO. ..... Union Supply Co.
CASPER, WYO. ..... Moss Equipment & Supply Co.
VANCOUVER, B. C. ..... Universal Equipment Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor, Close Works, Gateshead-upon-Tyne 8, England

Enter 1351 on Reader Card

Complete integrated automatic control systems are fast approaching reality

By J. P. PUCKETT*

Operators can follow the entire process from raw mix to clinker on this pictorial control panel by means of indicating signal lights, recorders and controllers

Instrumentation—is it a cure-all for kiln troubles?

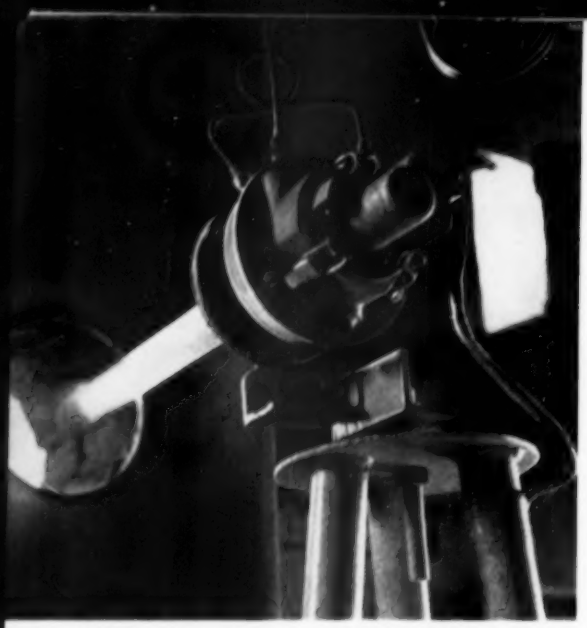
ROTARY KILN OPERATORS throughout the country have found that substantial savings can be effected in the production of cement clinker, lime and other nonmetallic products by utilization of modern applications of accurate measurement and control systems.

Stability of operation has long been recognized as the prime factor in economical kiln operation. Extreme fluctuations in the firing temperature quickly result in expensive refractory damage. Overburning or underburning the clinker can mean excessive "rings" and resultant loss of production time. Erratic inlet air temperature caused by faulty draft control and improper temperature measurements can easily mean thousands of dollars in wasted Btu's. And changes occurring in the feed end of the kiln may not be noticed at the firing end until too late to make the adjustments necessary for continuous stable operation.

*In charge, Ceramics Industries, Market Development Division, Leeds and Northrup Co.

Temperature control. For many years, kiln burners judged the clinkering and firing temperatures within the kiln solely by sighting through the cobalt glass directly on the moving product and manually adjusted the fuel input or kiln speed to maintain an estimated standard. The accuracy of this measurement rested entirely in the burner and his experience. Each shift throughout the day produced a product that varied depending on the experience of the burner.

To better check the difference in judgment of individual personnel, optical pyrometers were and are still used. This electro-mechanical device enables burners to take accurate measurements of moving product or kiln lining temperature. However, these measurements are made intermittently and fluctuations can occur between readings.



Radiation pyrometer is mounted to sight through a kiln in the firing hood directly on moving clinker or kiln lining. Signals from this detector are fed to an electronic recorder-controller that adjusts fuel valve to maintain control temperature

Instrumentation

continued . . .

Optical pyrometers are used to check the calibration of permanently installed temperature measuring and control equipment. These pyrometers also measure temperatures at points that do not require continuous recording

To provide a means of continuous measurement of clinkering or firing temperature, thermocouples were placed in the kiln wall, projecting through the lining into the moving product. Indicating and recording instruments measured the temperatures detected. But at best, extreme momentary fluctuations in temperature due to the piling up of the moving product and exposure of the thermocouple to the flame itself made accurate recording difficult, and the abrasive action of the clinker at high temperatures made thermocouple life short.

With the perfection of the radiation pyrometer, a great many of the early problems were resolved. This detector can sight on a hot object from a distance, focus the emitted radiation upon its thermopile (a series of thermocouples) and generate an electrical signal proportional to the temperature of the object sighted on. Its signal can easily be transmitted by ordinary copper wire to measuring instruments that continuously indicate and record this temperature. The detector is usually mounted to "look" through a hole in the kiln firing hood and adjusted to sight directly on the kiln lining or moving product. It is designed with a built-in lagged response to provide an "average" measurement that avoids the recording of momentary fluctuations due to flame and smoke in the kiln.

The electrical signal from the detector is received by an electronic indicating recorder. Operating on the null-balance potentiometer principle, this instrument "weighs" the signal and adjusts itself automatically to record, as temperature, the electrical impulse received. The temperature is recorded in ink on a moving calibrated chart and is indicated to the burner by a pointer moving on a large scale.

These recording instruments can be adapted to control temperature automatically by increasing or decreasing the fuel input according to demand.

Equally important to kiln stability is the temperature at the feed end of the kiln, commonly referred to as the backend. In wet process kilns the need for accurate temperature control in this area is especially vital. Inadequate dehydration of the slurry in the chain zone can result in formation of "mud rings." These rings impede the flow of raw material through the kiln and when breaking down release large amounts of unburned product overloading the burning zone.

Variation in dehydration can be minimized when the temperature at the backend is held constant even though raw slurry with varying amounts of moisture and solids is introduced into the kiln from the feeder.

The temperature at the backend is a function of the amount of hot gases passing through the kiln, which is in turn a function of the kiln draft. Realizing this, engineers at the Leeds and Northrup company constructed for a large southern cement company an unique method of controlling this temperature by adjusting the draft in the kiln.

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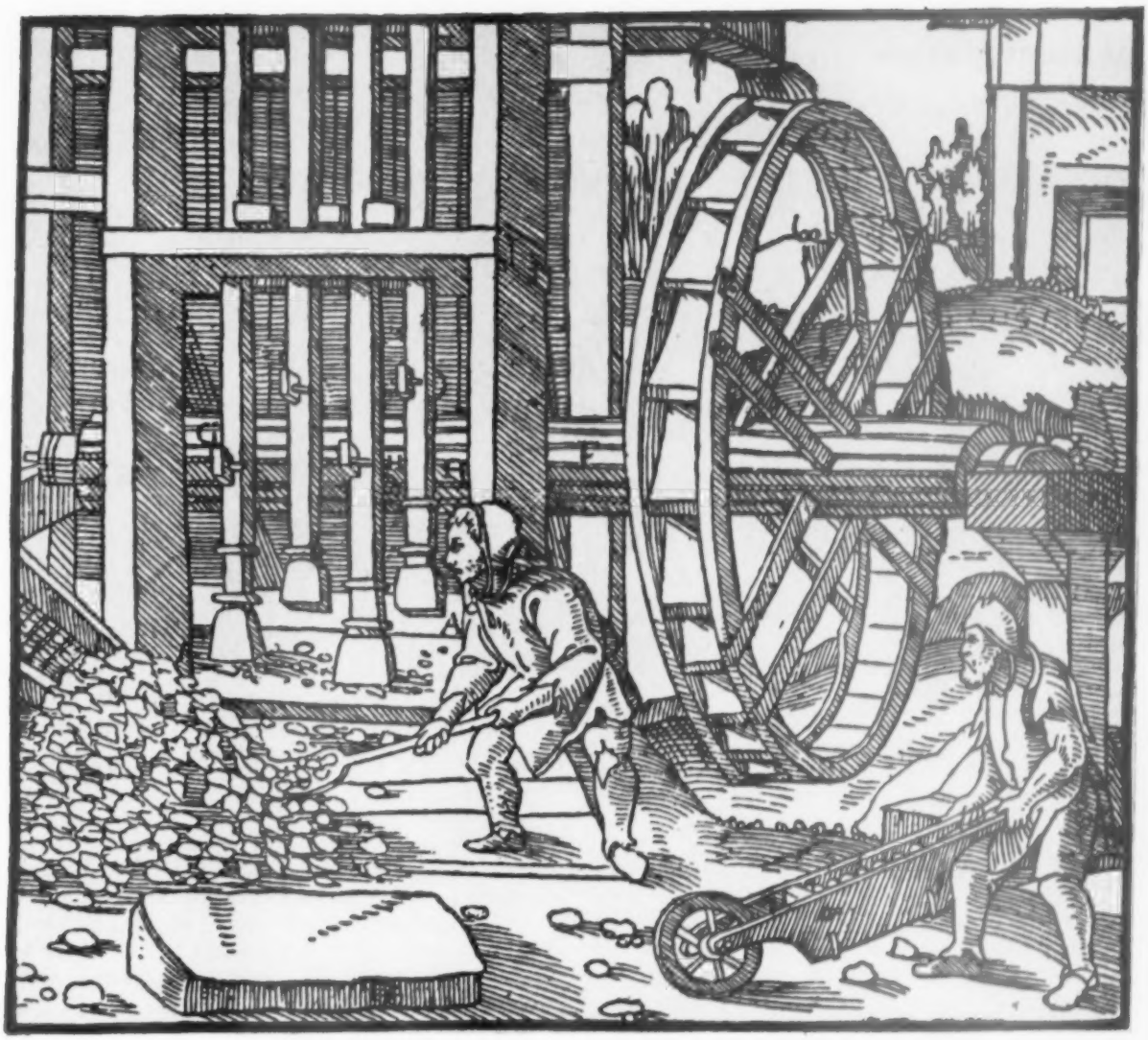

Production Was Slow

It took only one man with a primitive wheelbarrow to haul away the production of this seventeenth-century grinding mill. For all of its grinding was accomplished by just four iron-headed stamps.

Today's grinding is as fast as yesterday's was slow. The modern mill produces many tons of ore in a single day, thus making possible our "metal age" civilization. This amazing production is possible largely because modern mills utilize efficient grinding media like the grinding balls and grinding rods produced by CF&I. Since they are always produced from special analysis steels that have the proper balance between toughness and hardness, CF&I Grinding Balls and Grinding Rods assure optimum grinding ability and maximum wearing ability.

THE COLORADO FUEL AND IRON CORPORATION

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Instrumentation

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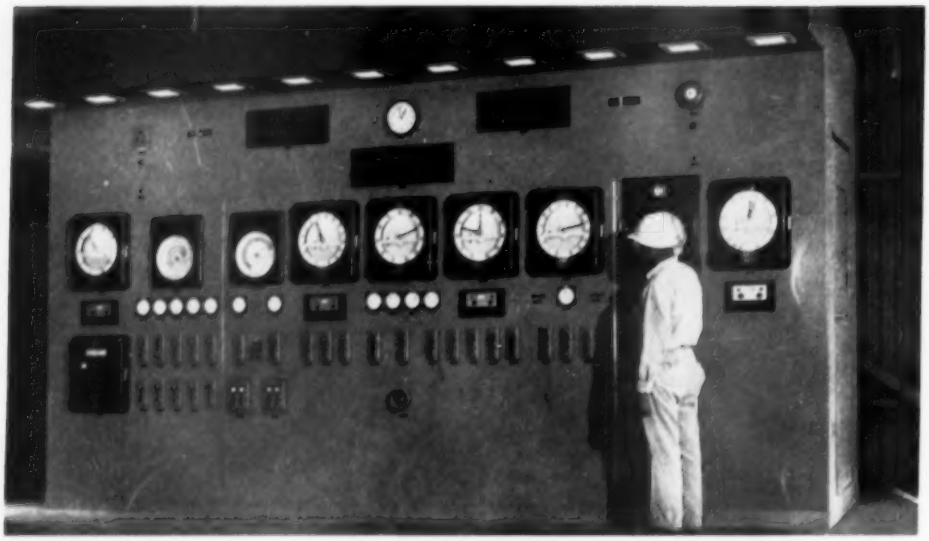


Functional kiln control panel. Instruments are, left to right: cooler temperature control, draft recorder, draft recorder, backend temperature controller, kiln speed recorder, oxygen analyzer recorder, precipitator temperature recorder, fuel flow recorder, firing temperature controller

A thermocouple is placed in the kiln backhouse and connected to an electronic temperature recorder-controller located on the centralized kiln control panel. This controller is in turn connected to a draft controller operating the louvers on the induced air fan. When temperature falls below the desired set point, the instrument acts to drive the set point of the draft controller upscale and increase kiln draft, bringing hotter gases from the firing zone to increase backend temperature to the desired point.

Pressure control. The amount of air entering the kiln combustion area from the product cooler is another of the important factors affecting the stability of kiln operation.

This amount is a direct function of the temperature and pressure within the cooler and hood system. When these two variables are accurately measured and either manually or automatically controlled, combustion can be complete and cooling of the firing zone by excess air can be avoided.

The latest method of cooler temperature measurement, a radiation detector similar to that used to measure firing temperature, is mounted to sight directly on the clinker bed in the cooler. With the temperature clearly indicated and recorded, adjustments can be made to increase or decrease the amount of cool air introduced through the bed by adjusting the louvers on the cooler fan system.

Operating together with this temperature controller, a draft controller adjusts the cooler exit stack damper to maintain constant cooler and hood pressure.

Recent studies and field trials have shown that the oxygen concentration in rotary kiln exit gases can be used as a reliable index to combustion efficiency. In any combustion process, complete fuel utilization can only take place when there is sufficient oxygen present for total burning. Too little oxygen means unburned fuel. To much oxygen can mean unwanted cooling of the kiln firing zone and wasted heat dollars. Accurate oxygen measurement provides a means of maintaining optimum fuel-air ratio.

In the plants where continuous oxygen measurement has been installed, operators have found it to be a convenient yardstick for economical kiln operations. Excess air was usually held from three to six percent.

Modern steam jet water-washed sampling systems and sensitive magnetic oxygen analyzers have made exit gas analysis accurate, simple and virtually trouble free. Plants without these measurement systems have been found to have as much

Please turn to page 180

Proven quarry worker available

HAS FOUR-YARD SHOVEL . . . WILL TRAVEL

Will travel . . . there's the key to the real value of an Allis-Chalmers HD-21G tractor shovel. It not only digs and loads four yards at a pass, it is mobile enough to work in all parts of the pit . . . and flexible enough to do many different jobs well.

Besides loading trucks, the HD-21G can help maintain haul roads, carry material from quarry face to stockpile, feed or clean up around conveyors, or even travel out of the quarry to clear land for future operations.

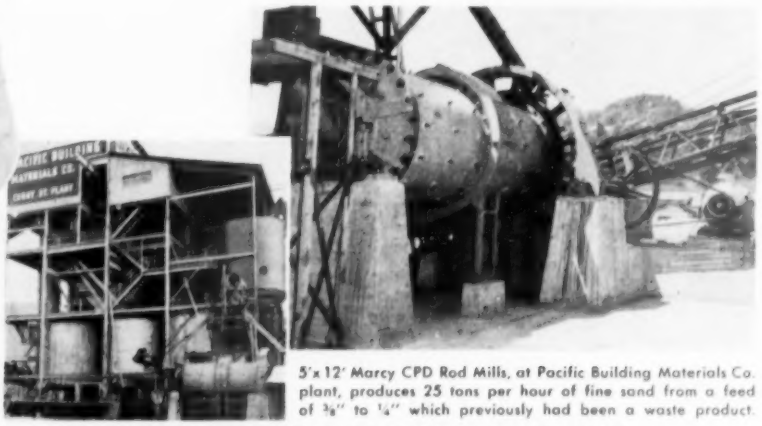
Let your Allis-Chalmers dealer show you the many ways an HD-21G can work profitably for you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

See what Marcy can do for you!

by manufacturing sand from waste gravel

Many companies, like Pacific Building Materials Co., Portland, Oregon, have found that they can very profitably convert waste pea gravel to desired fines and also improve the physical characteristic of their concrete, and other sand . . . by using Marcy Center Peripheral Discharge Rod Mills.



5'x 12' Marcy CPD Rod Mills, at Pacific Building Materials Co. plant, produces 25 tons per hour of fine sand from a feed of ⅜" to ¼" which previously had been a waste product.

PROVED ADVANTAGES OF MARCY CPD ROD MILL

Produce desired sand on location, save hauling costs.

Manufacture sand from waste gravel

Better Sand Product. Grinding in a Marcy CPD Mill will produce for you a uniformly cubical shaped product with same characteristics of shape and strength throughout the range of sizes produced. This results in:

- **stronger concrete**
- **better finish on concrete**
- **better slump characteristics**
- **use of less cement**

Operating Advantages. Compared with crushing, experience has proved you will get these additional advantages by grinding with Marcy CPD mills:

Low Cost...low maintenance, less steel consumption and less power per ton result in an overall cost generally less than 25c per ton, exclusive of ammortization.

Flexibility...by varying rate of feed, pulp dilution and discharge port area it is possible to change gradation of finished product to meet different specifications.

Cleaner Operation
Wet or Dry Grinding
Capacities from 2 to 200 dry tons per hour.

NO EXTRA CHARGE FOR MARCY® EXPERIENCE

SALES AGENTS AND LICENSED MANUFACTURERS THROUGHOUT THE WORLD

THE MINE AND SMELTER SUPPLY CO.

DENVER NEW YORK SALT LAKE CITY EL PASO

Floating plant processes aggregate for Lake Pontchartrain bridge

General view of the floating screening plant

The 24 mile long bridge spanning Lake Pontchartrain is the longest vehicular bridge in the world, and the biggest precasting job ever undertaken. Its rapid successful completion depended to a large extent on finding an adequate and reliable source of aggregate

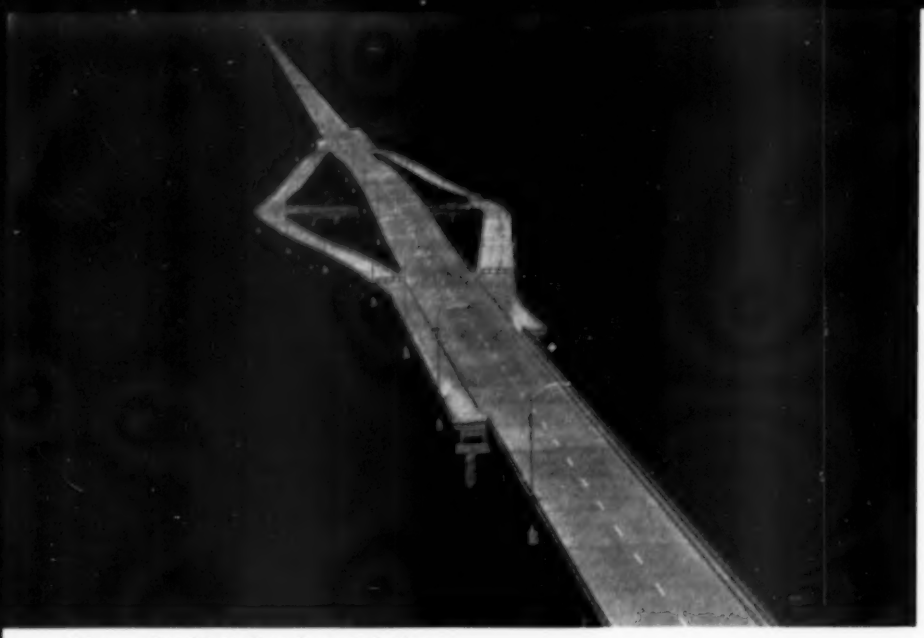
By D. W. MILHAN*

THE LOUISIANA BRIDGE CO. used a floating processing plant to produce aggregate for the precasting operation on the Pontchartrain bridge. Our firm, a joint venture of Brown & Root, Inc., of Houston, Texas, and T. L. James & Co., Inc., of Ruston, La., designed the plant and had it built by Equitable Equipment Co. at Mandeville, La.

After considerable exploration we found a site for aggregate production on the east side of the Pearl River Canal about a mile south of Lock 2. To prepare the site for mining, it was necessary to build an earthen dike around the north, east and south sides before cutting the levee and excavating a channel for entrance of the plant. A Bucyrus-Monighan 200 W with a 6½-yd. drag bucket was used to build the dike and to strip the overburden, which averaged 5 ft. The Monighan was used to load the plant after production started. Maximum output attained was about 48,000 tons per month, using two shifts.

The processing plant was mounted on a barge 40 ft. wide x 140 ft. long, with four spuds for anchoring and two winch lines for traveling. The aggregate was loaded into the top hopper. From there it fed onto a 5 x 12-ft. scrubber screen via a Stephens-Adamson plate feeder that had a rated capacity of 160 tph. The scrubber removed clay balls and a very small amount of plus 1½-in. oversize.

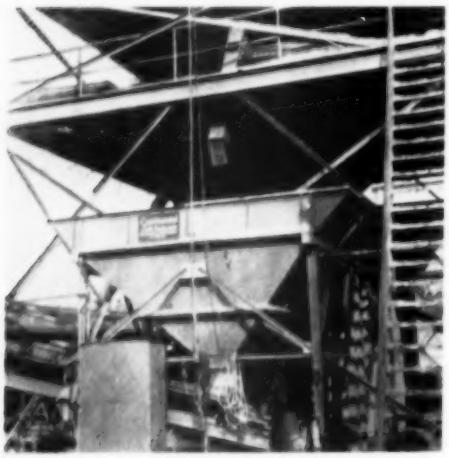
*Project Engineer, Louisiana Bridge Co.



The completed Lake Pontchartrain bridge

Floating plant

continued . . .



One of the surge bins on the floating plant

Material passing the scrubber chuted onto two 5 x 12-ft. screens. All screens were furnished by Simplicity and various meshes were used to secure the results desired. For the most part we used one 5/16-in. mesh and one 7/16-in. mesh since the natural deposit had a surplus of sand and pea gravel. With these, we could waste the pea gravel with the sand for the material passing the 7/16-in. screen and use the material passing through the 5/16-in. screen for sand.

While the plant was originally designed to separate the coarse aggregate into several classes for blending at the concrete batching and mixing plant, our deposit permitted us to operate the processing plant to produce only the blended coarse aggregate and sand. The coarse aggregate dropped down into storage bins, from which it was loaded onto flat deck cargo barges by conveyors. The sand was conveyed by a sluice trough and discharged to a waiting flat deck barge with cargo box. The trough had a diversion gate permitting the desired delivery of sand. The remainder dropped down into a sump within the barge. A 12-in. Morris sand and gravel pump discharged the waste sand to a disposal area through a 12-in. discharge line, supported on floats.

The Morris pump was belt-driven by a Caterpillar D13000 unit. Water for processing was supplied by an Allis-Chalmers centrifugal pump rated at 3,000 gpm. and driven by a directly connected Caterpillar unit. The power for operating screens, winches and conveyors was furnished by a Caterpillar 13000 three-phase generator.

Once the aggregate was produced, our biggest problem was in delivering it from the aggregate plant down the treacherous west Pearl River, through the Rigolets, and then along the north shore of Lake Pontchartrain to our precasting plant at Mandeville. We had three 45-ft. twin screw towboats and about 22 barges making the 75-mile trip. Low water, high water, locks and bridges all contributed to making the aggregate tows a major effort, but we were always able to operate our casting plant with no shortage of material. Work on the bridge went along so well that it was completed four months ahead of schedule.

END

400 FT. (IN 12-18 FT. DEPTHS) PER 8-HOUR SHIFT, IN HARD MISSOURI LIMESTONE, ON 36 GALLONS OF FUEL

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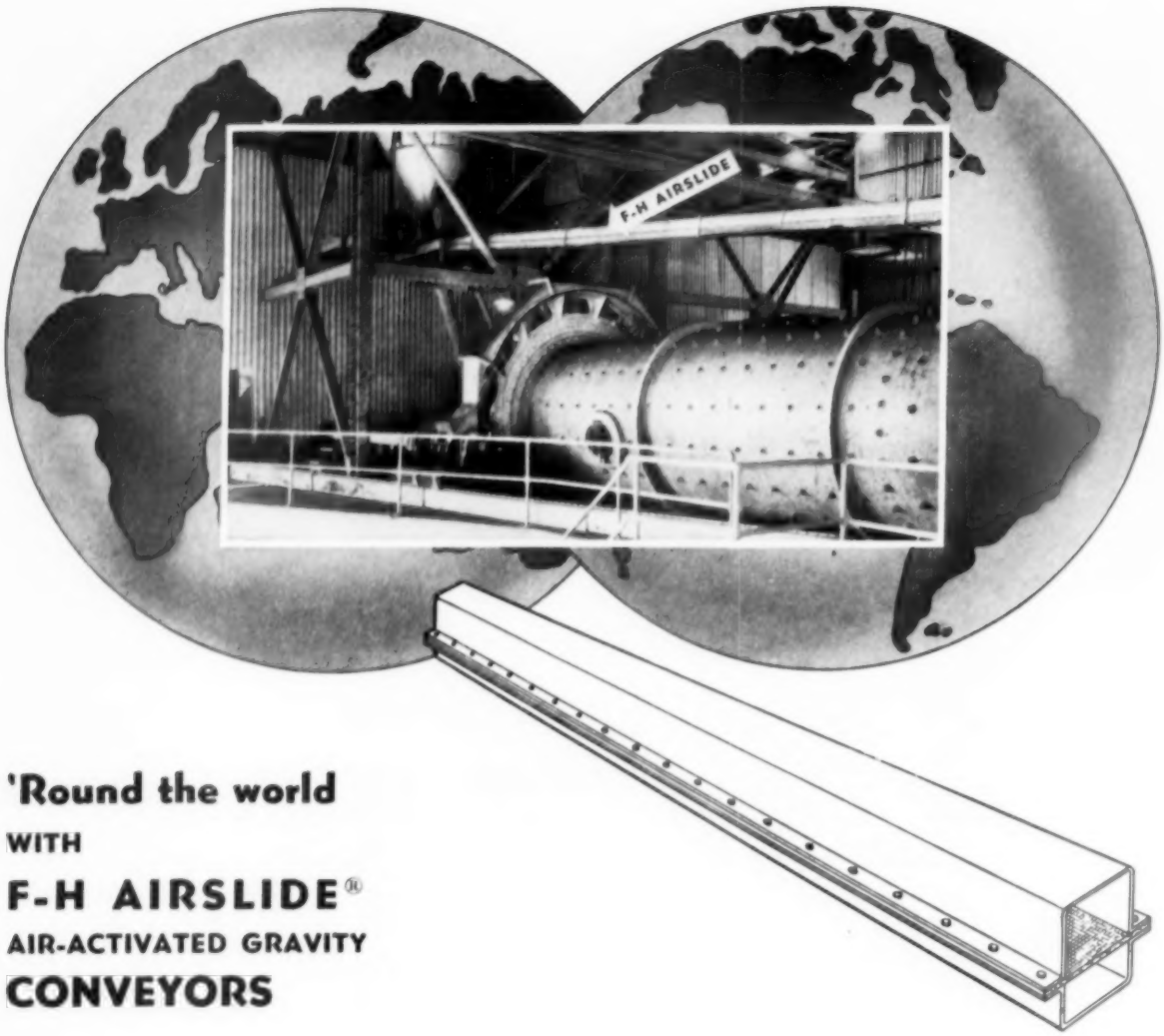

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There are many good reasons for the universal acceptance of this conveyor. Simplicity of construction and installation. Comparatively light in weight, it can be suspended from overhead or placed on the floor. No moving or working parts, maintenance is nil. Nothing moves but the material and air. Benefits are constant and substantial.

Power—exceedingly low. Small fan or blower is sufficient to supply air at low pressure to fluidize the material being handled, which flows by gravity on a slightly inclined plane, the degree of slope depending upon the material conveyed.

Illustrated above is an Airslide installed in a cement plant in the Phillipine Islands, conveying oversize material (rejects) in the finish grinding mill circuit from separator to mill for further grinding. Airslide is 10" in width and 50' in length and handles 500 bbl. of finished cement tailings an hour. The only power required is a 2-hp. blower. Quiet, clean, efficient, low-cost conveying and, no moving parts to wear or get out of order.

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In Los Angeles Basin area . . .

Diesels pass rugged test under unusual conditions

By KENNETH R. MacDONALD

SOUTHERN CALIFORNIA aggregates producers, trying to cope with the building boom in their area, have started experimenting with diesel engines. They have found that, in certain geographic locations, diesel engines can do more work faster and at less cost per operating unit on medium-duty trucks than can gasoline powered vehicles.

The rather unusual geographic aspect of the Los Angeles Basin contributes to the popularity of this new application of diesel power. While the rock and gravel deposits of the area are located in the foothills of the San Gabriel Mountains, much of the demand for aggregates comes from the so-called "harbor" cities of Long Beach, San Pedro and Wilmington.

The average haul is 40 miles from the gravel pit areas to the concrete ready mix and hot asphalt plants along the beach. All of this distance is traversed via heavily congested roads where lightweight and fast moving transport rigs are essential.

To demonstrate what could be accomplished with high-powered, lightweight diesel powered aggregate transport equipment, a number of rock products dealers and manufacturers in the Los Angeles area recently combined to construct a rig specially designed for this service.

The J. T. Jenkins Co., the Kenworth truck dealer in Los Angeles, took the lead in the project.

The experimental rig consists of a 175-hp. Cummins Model JT-6-B Turbo-diesel used with a Fuller Model 5C65 direct-in-fifth transmission and a Brown-Lipe Model 6231A auxiliary.

The rig itself has a Model R 200 Timken double reduction rear axle with a Kenworth third axle attachment. The gear ratio is 6 x 38:1 and provides 53 mph. at 2,500 rpm. in fifth over.

The rig was demonstrated to a number of rock firms in the area and careful time and fuel consumption checks were made. Hauling 27.2 tons of pay load, this Kenworth consistently shaved 20 percent off the round trip times of gasoline trucks pulling smaller loads.

"We have found the diesel engine power to be truly exceptional in hauling rock, sand, cement, fill, decomposed gravel and other similar company products."

Diesel engines

continued . . .

"These engines have sufficient reserve power to start and stop quickly in heavy traffic and to negotiate hills easily."

In the words of some of the drivers, these engines permit them to "wind up and unwind" rapidly in traffic, with a greater amount of flexibility and maneuverability.

The San Diego Transit-Mixed Concrete Co. has also discovered that it is possible to maintain higher average speeds with its trucks, without increasing the equipment's maximum speed, by employing diesels. These engines have sufficient reserve power to start and stop quickly in heavy traffic and to negotiate hills easily. They are thus able to turn in more round trips each day than gasoline-powered rigs and they do so at a lower fuel cost. Operators also have found that diesel engines are available 25 percent more of the time than are gasoline trucks, because of occasional failures in the ignition system of the latter.

The company now has 12 Cook Brothers M-310 JD chassis transit mixer rigs, with 6½-cu. yd. Challenge mixers. Power for these transit mixers is furnished by Cummins JT6B diesel engines of 175 horsepower. This engine not only powers the truck, but also furnishes the power for the mixer itself, through the front engine drive engineered and developed by the Cummins Engine Co. and Cook Brothers Equipment Co.

Please turn to page 152

This Bucyrus-Erie walking dragline swings a 10-yd. bucket on a 235-ft. boom, stripping "mountains" of overburden at an Ohio limestone quarry.

Moving "Mountains" is a regular assignment for Bucyrus-Erie walking draglines

The speed with which Bucyrus-Erie walking draglines literally "move mountains" of overburden is visual proof of their working ability. And the fact that users continue to choose them again and again is proof of their over-all economy and unmatched performance.

Each of the ten models—the world's largest selection—features front-end design that combines great strength with light weight, exclusive Bucyrus-Erie cushioned walking action for fast moveups, and Ward Leonard variable-voltage swing motors on both Diesel-powered and all-electric powered draglines provide fast, responsive swing.

If moving large quantities of material is one of your problems, contact us for full information on the Bucyrus-Erie answer — big-capacity walking draglines. 150157

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

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One firm discovered that diesel engines allowed their trucks to turn in more round trips each day than gasoline-powered rigs

Diesel engines

continued from page 150

"We have found these units to be exceptionally satisfactory in our operations," explains J. T. Elliott, Superintendent for the company. "They have produced for us a substantial savings in fuel, over our gas powered mixers, and at the same time are capable of delivering more concrete per day. Diesel powered trucks are especially adaptable to the terrain we have here in San Diego. They perform much better on our hills than any other equipment we have ever owned."

"We now have," Elliott declares, "what we consider to be accurate records of approximately one year on this diesel engine equipment versus the gasoline powered equipment, and these records verify the savings on fuel."

San Diego Cement Co., affiliated with San Diego Transit-Mixed, uses Peterbilt tractors pulling Cook Brothers semi-trailer and pull-trailers. This equipment is used in the transportation of rock, sand, cement, fill, decomposed granite and other similar company products.

"This equipment," Elliott says, "normally hauls for far greater distances than our mixers and we have found the diesel engine power to be truly exceptional in this kind of work. Actually, there is no comparison between the gasoline powered and the diesel powered tractors for this particular phase of our operation."

Weight reduction in equipment is of major importance to the ready-mixed concrete companies.

At one time a satisfactory profit could be made with mixers that had capacities of 4½ to 5 cu. yds. Today the need is for 5½ to 6-cu. yd. mixers. However, weight limitations on roads and streets require lighter equipment in order to haul the heavier loads.

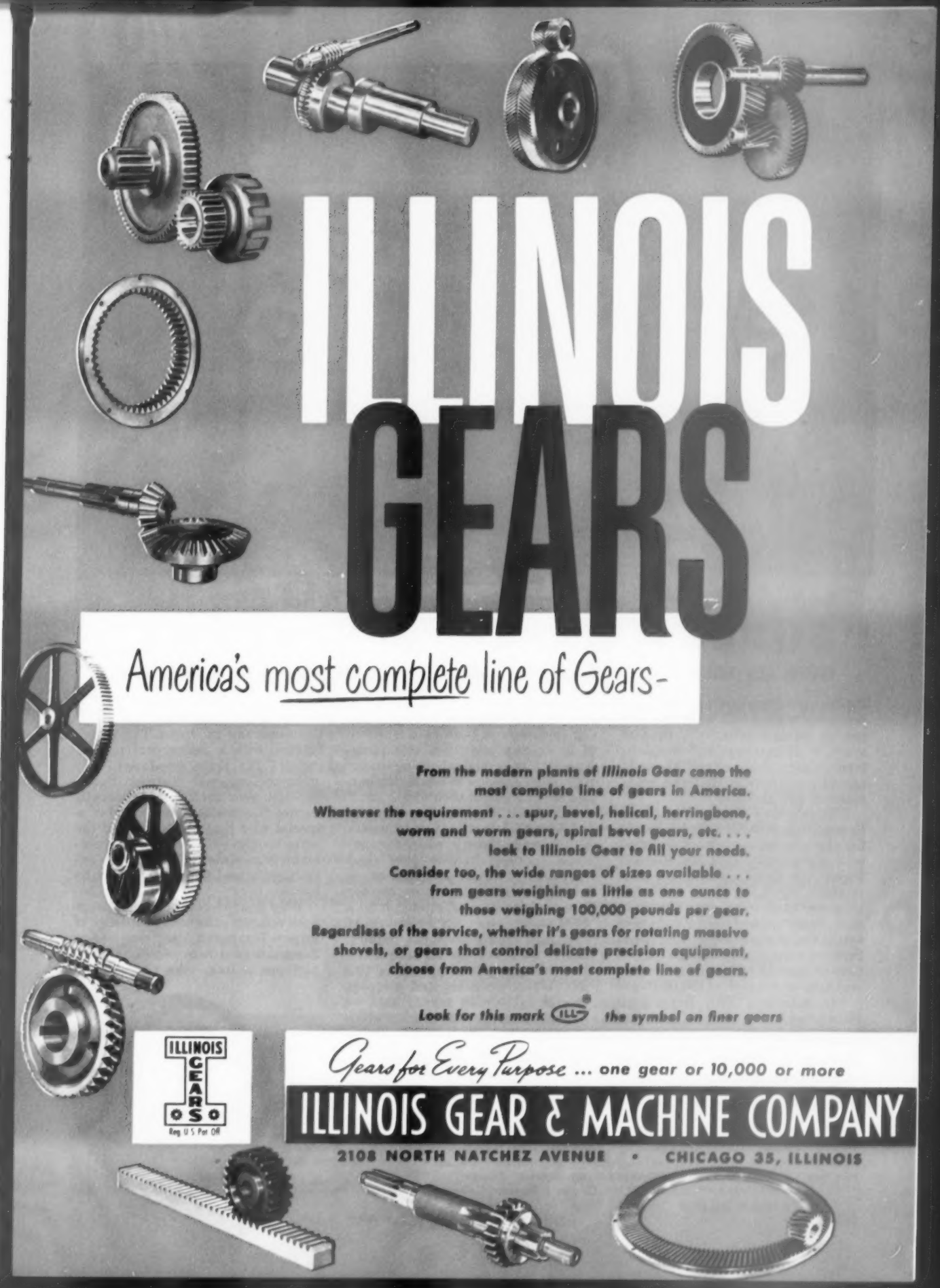
While the diesel engine normally is larger and heavier than a gasoline engine, a compensating factor has been that power take-offs on the truck engines are being more and more utilized to turn the concrete mixer. Formerly a small gasoline engine was on the rig to run the mixer and this has now been eliminated.

Hauling loads of this weight, under city traffic conditions, the fuel consumption average of around six miles per gallon was considered spectacular.

Tare weight of the unit is 23,260 lb. which, with a legal limit of 77,600 lb., permitted the truck and trailer to haul a combined payload of 27.2 tons; 13.8 on the truck and 13.4 on the trailer.

Aluminum was used in the construction of the cab, frame and the cross-members of the truck and the ABC Body Co., Los Angeles, also used aluminum in the construction of the dump body frame and bed. A weight saving of 270 lb. per axle was achieved by the use of Firestone tubeless tires with high-tensile steel high-center rims.

END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Bayer and Mingolla Construction Company reports:

"SUPER-TEMPERED SCREENS

GIVE US 100% GREATER TON-LIFE AND MORE UNIFORM AGGREGATE"

Producing a quarter of a million tons per year of what an official state testing agency calls "the hardest stone in Massachusetts," the Ashland division of Bayer and Mingolla has to have screens that can withstand severe abrasion.

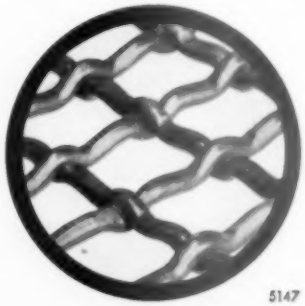
"That's why Super-Tempered Screens are standard replacements for the original equipment supplied on our crushers," says Mr. Richard Bayer, the division's plant superintendent. "In spite of the fact that they are used to process blue trap rock, granite, hard basalt and other types of hard stone, Super-Tempered Screens consistently handle 80,000 tons or more of rock without a split, and some last as high as 100,000 tons!

"In addition," Mr. Bayer continues, "we find that Super-Tempered Screens constantly deliver uniform sizes, reduce waste and rejects, cut our replacement time to a fraction of its former cost, eliminate problems due to screen whipping under rock flow, and lower our downtime as a direct result of their longer life."

About accuracy, Mr. Bayer points to a recent job for the Massachusetts Toll Road Authority, where the material supplied had to pass rigid "per cent by weight passing through screen" tests. "On ¾" stone top for bituminous concrete, retention on a #200 screen could not exceed ½ of 1%. And similar stringent requirements were set up for the other sizes of aggregate supplied for this job. When we submitted samples, the official testing agency said we were getting *perfect* uniformity, which is, in our opinion, something of a record for any contractor. We credit the accuracy of Super-Tempered Screens with a major part in this record," Mr. Bayer concludes.

Super-Tempered Precision Space Screens give such long, accurate service because they are made of a special wire that's oil quenched for extra toughness . . . crimped to precision standards . . . and woven extra tightly on heavy-duty hydraulic looms.

Why not get complete details on how you can take best advantage of Super-Tempered Precision Space Screens in your own operations? Contact our nearest sales office today.



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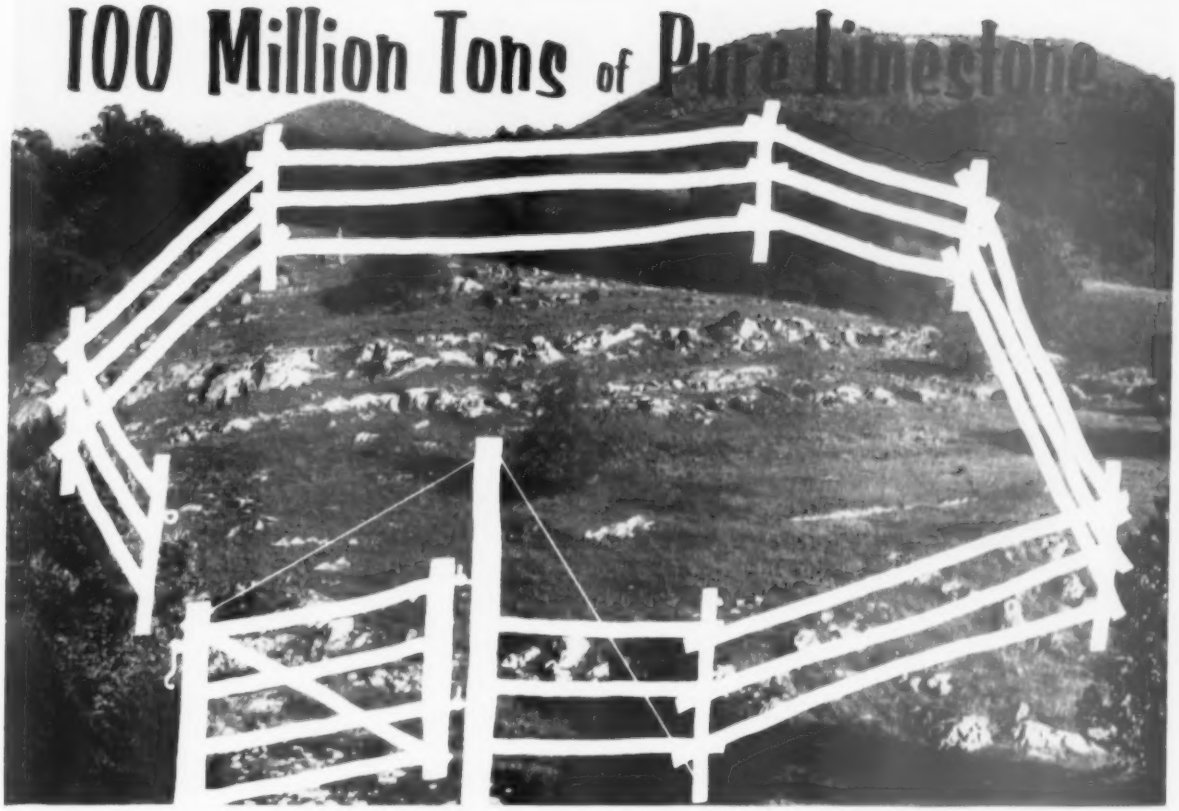

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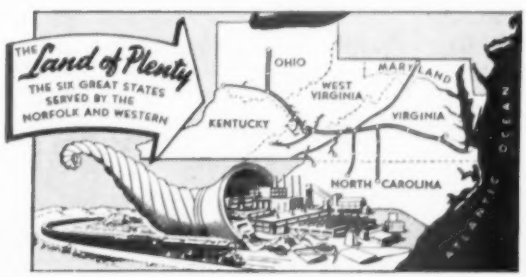

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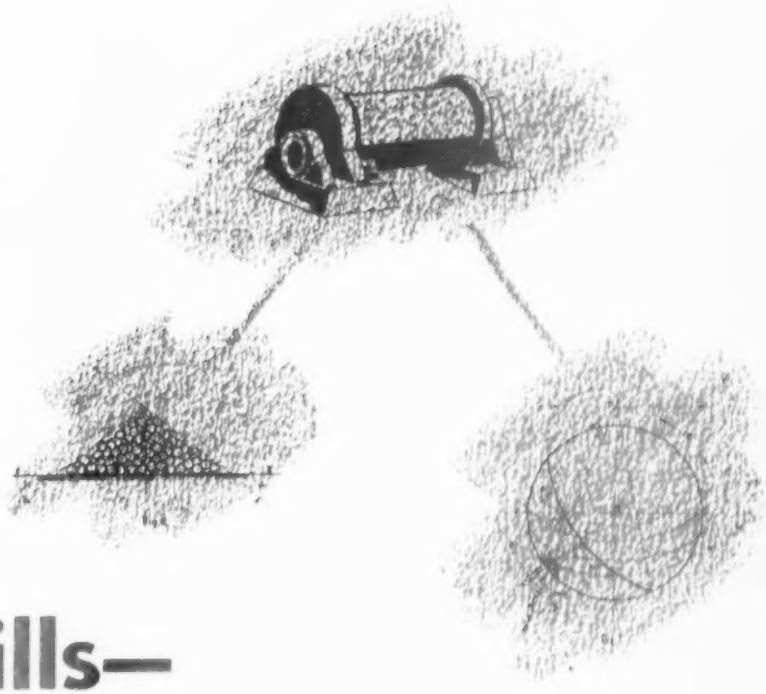
ROLL-AWAY is an Allis-Chalmers trademark

These are five of many reasons why Allis-Chalmers FORTY FIVE motor graders are showing up in more and more mining and quarrying operations. They are precisely what the dirt-moving specialists ordered . . . ready now to handle haul road construction and maintenance easily, smoothly. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

Part 1

By GEORGE J. HALBART and
VICTOR F. FREYMANN*



Ball mills—

their efficiency can be improved!

European research team makes a rational study of the inner lining of ball mills and shows how the grinding process can be improved

THE EFFICIENCY OF A BALL MILL is very low, but until the industry finds a different type of machine for use in fine crushing, every effort must be made to improve existing machines.

In a rotary ball mill, or in a mill using any other type of grinding bodies, the tumbling charge is the main working unit, but the inner lining of the mill plays an equally important part in its operation. All the energy expended by the mass of grinding bodies is transmitted to that mass by the lining. The efficiency of the whole machine will be a direct function of the efficiency of this energy transmission part.

The part played by the lining is important for other reasons. Before the mill is started, its lining will condition the pattern into which the crushing bodies will settle in the mass, and will later determine the dynamics of the bodies.

We will attempt to establish the conditions with which the lining must comply and will draw conclusions. We do not claim to state original views only. We have drawn on the great amount of work that has been done and have tried to follow the paths of previous knowledge. Occasionally, we have been able to make a contribution.

We realize that, in practice, the theoretical results mentioned in this paper cannot be fully achieved, particularly due to the use of different balls in industrial charges. Nevertheless, a theory, even if not perfect, is a surer and more productive logical basis than simple improvisation.

Part of the charge of a mill in operation remains

*Mr. Halbart is Managing Director of Les Fonderies Magotteaux Ltd., Vaux-Liège, Belgium; and Mr. Freymann is Head, Technical Studies Dept., of the same firm.

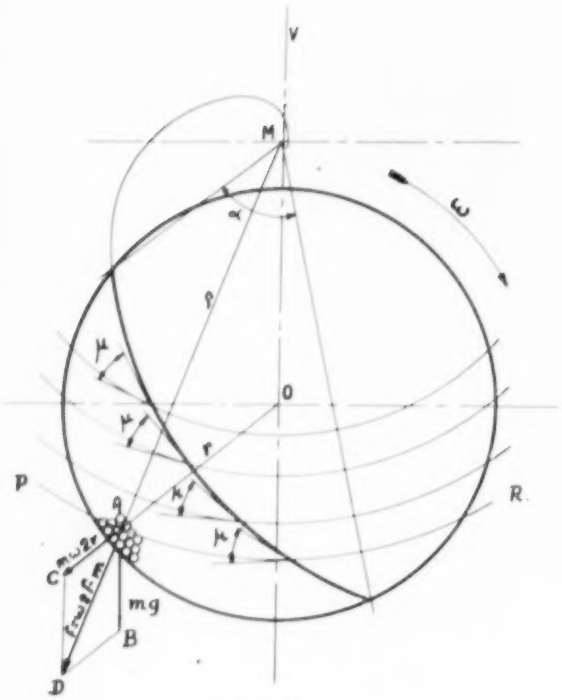


Fig. 1.

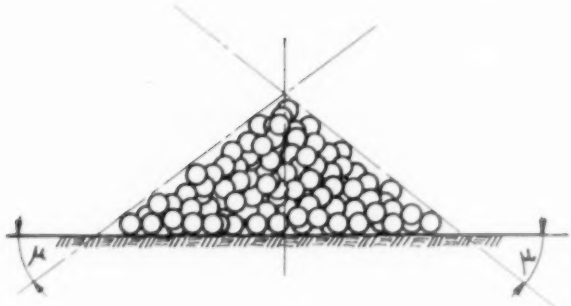


Fig. 2.

Ball mill efficiency

continued . . .

compact at all times and is driven by the lining at an angular speed which will be the same as that of the lining itself.

Any crushing body in this mass is subjected to the force of gravity and to centrifugal force independent of the forces exerted upon it by adjacent bodies.

If **m** is the mass of the body A (Fig. 1), its gravity will be **mg**, as represented by **AB**.

If ω is the angular speed of rotation of the compact mass, the centrifugal force will be $m\omega^2 r$. This is represented by AC, where r is the distance between the center of gravity of the body and the axis of the mill. The resultant force is represented by vector AD. The extension of vector AD will intersect the vertical OV at a point M which will be the same for all the balls in the mass. OAM and ABD are similar triangles and therefore:

$$\frac{OM}{OA} = \frac{AB}{BD} \qquad (1)$$

or

$$\frac{OM}{r} = \frac{mg}{m\omega^2 r} \qquad (2)$$

or $$OM = \frac{g}{\omega^2} \qquad (3)$$ for any given ball.

On the other hand:

$$\frac{AD}{DB} = \frac{AM}{OA} \qquad (4)$$

$$\frac{AD}{m\omega^2 r} = \frac{AM}{r} \qquad (5)$$

$$AD = m\omega^2 AM \qquad (6)$$

But AD is a measure of the intrinsic force exerted on the body independently of any forces due to contact with adjacent crushing bodies.

According to equation (6) above, this force is equal to the centrifugal force which would be exerted if the compact mass revolved **around point M**, with an angular velocity of ω.

Under these conditions, taking M as a center, we now draw a number of arcs of different radii (Fig. 1). It will be clear that all the bodies on each of these circles (e.g., PAR) are subjected to a resultant radial force of constant value. If ρ is the radius (MA) of this circle, this force will be:

$$f = m\omega^2 \rho \qquad (7)$$

Circles such as PAR may be considered the contour lines of the compact mass, forming a field, which results from the combination of the force of gravity and of the centrifugal force. This, incidentally, enables us to find a simple physical interpretation of the curves given by Uggla.

Please turn to page 160

looking for

BIG TONNAGES

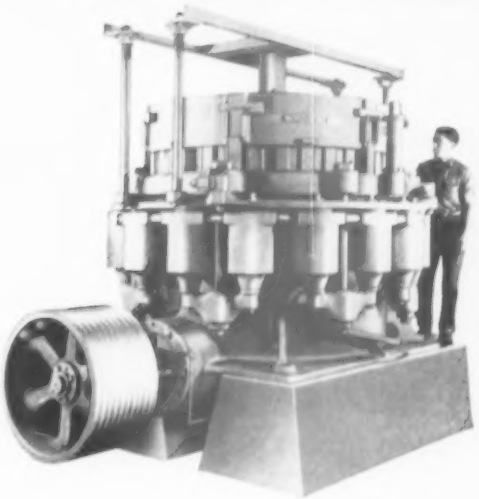
of finely crushed product?

. . . then you need the Gyradisc® CRUSHER

HERE *you see a handful of specification sand made by the Gyradisc Crusher . . . from a Pea Gravel feed, previously considered a "costly, difficult material to crush."*

This is but one example of what producers may expect of the Gyradisc Crusher . . . but more important, the Gyradisc in most cases substantially reduces the cost of producing a finely crushed product . . . such as manufactured sand or other specification material from a minus $\frac{3}{4}$" feed of crushed stone or Pea Gravel.

The Gyradisc Crusher is designed specifically for the low cost, large volume production of fines. If you are faced with a critical shortage of fine material, want to expand your market or want a profitable solution to the problem of handling and disposing of excessive Pea Gravel or other unsaleable material . . . it will pay you to investigate the Gyradisc. It has benefited other operators and may help you. *Nordberg Mfg. Co., Milwaukee, Wisconsin.*



Built to supplement the Symons® Cone Crusher, the 54" Gyradisc Crusher is providing volume production of still finer specification material. It is currently being used for the production of many materials such as agricultural limestone, limestone chips, sand, rock dust, crushed stone for asphalt mix and the fine reduction of asbestos and talc. *Write for Bulletin 228.*

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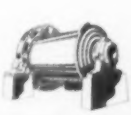
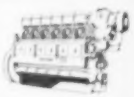
Symons Gyratory and Cone Crushers

Nordberg Grinding Mills



Symons Vibrating Grizzlies and Screens

Nordberg Engines 10 to over 12,000 hp.



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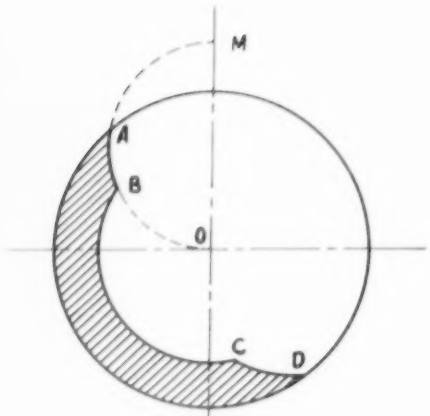

Fig. 3a.

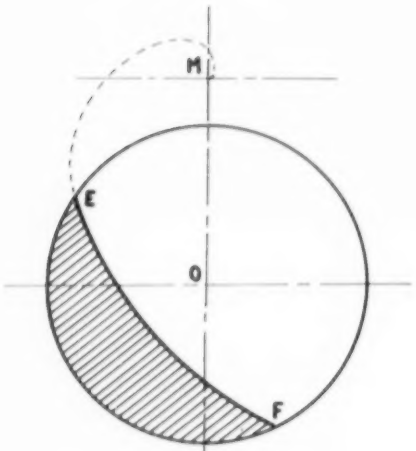

Fig. 3b.

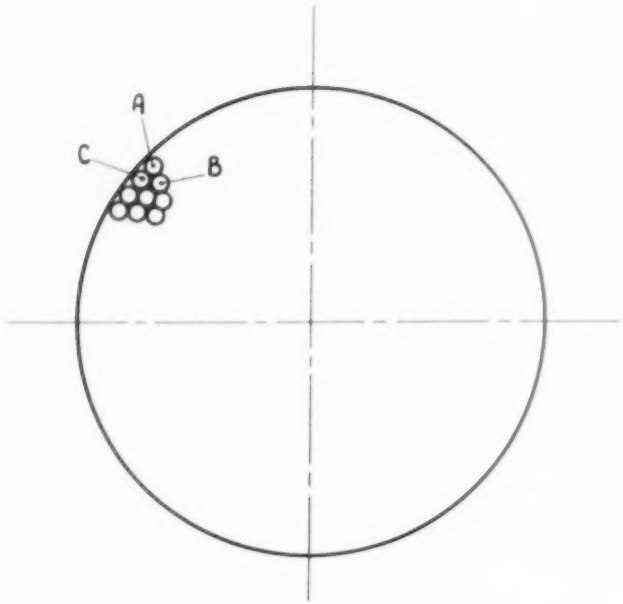

Fig. 4.

Ball mill efficiency

continued from page 158

If a pile of crushing bodies is placed on the ground (Fig. 2), and combined with the material to be ground, its upper surface will come to rest at an angle μ to the horizontal. This angle is the natural slope of the charge in question.

If this pile is inside a revolving mill, the horizontal lines, forming the contour lines, are then replaced by circles with M as center. The upper surface of the pile will form a surface such that its trace at all points will be at an angle μ to the circle which it intersects.

The equation of this trace is precisely the equation of the curve of Uggla. It is a spiral, the pole of which is M and which is expressed by the equation $r = Ce\mu^{\alpha}$.

This enables us to calculate the intrinsic force exerted on any given body in the compact mass.

The limits of this compact mass have already been dealt with by Davis and by Uggla.

Davis considers that these limits are (Fig. 3a):

a portion AB of the half circle OM, where OM equals g divided by ω^2,

a portion BC of the circle of which O is the center,

a portion CD of a curve (Pascal's limaçon) the equation of which is supplied by Davis' theory.

Uggla believes that the limit is a portion EF (Fig. 3b) of the spiral referred to above.

We consider the two theories to be complementary. To establish whether ball A (Fig. 4) is still a part of the compact mass or whether it has become unstable in relation to that mass, we must envisage two possibilities:

1.) ball A rests on the lining and on ball C (Davis' theory gives us the limit of stability of balls resting in this way).

2.) ball A rests on ball C and on ball B. Here Uggla's theory gives us the limit of stability. We will have to take into account, in each case, the theory which is most favorable to the stability, since in the same mass, at the same moment, certain balls may be stable according to Davis while others would be stable according to Uggla.

To do this we could draw, theoretically, the Davis curves and Uggla's curves, for a given speed

Please turn to page 162

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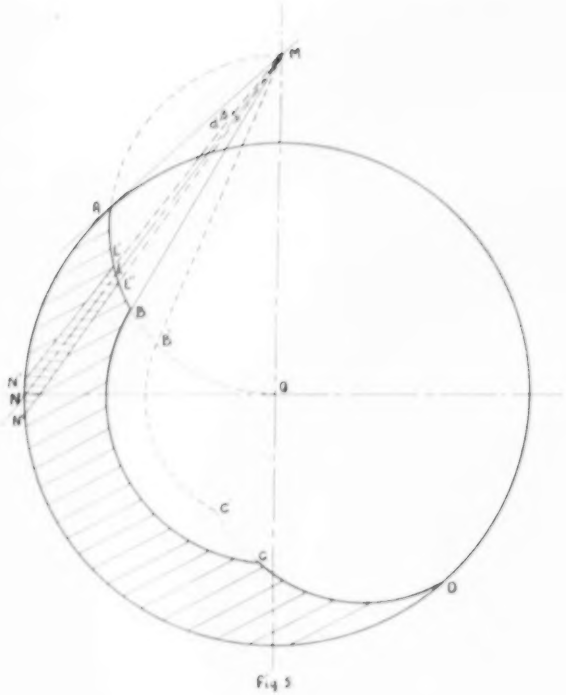

Fig 5

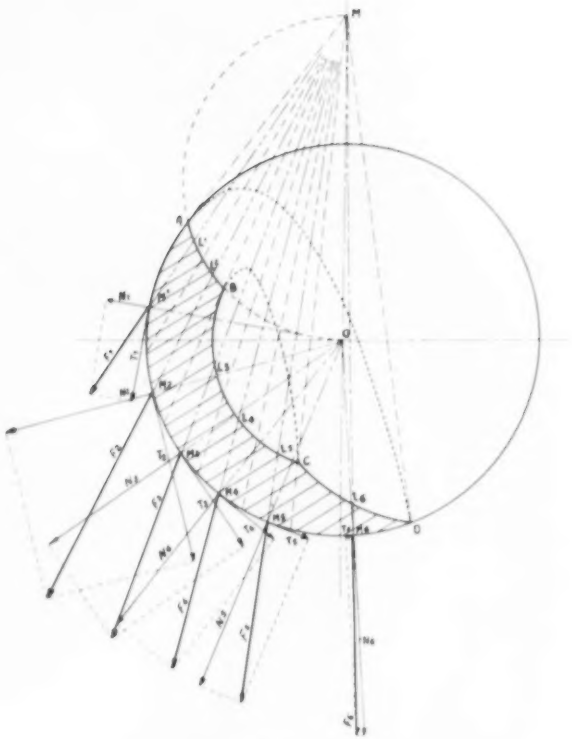

Fig 6

Ball mill efficiency

continued from page 160

(assuming that angle μ of the bodies under consideration is known). We would then combine these curves and draw the various extreme limits of stability, each one corresponding to a given loading coefficient.

Since for the usual loading coefficient, or for lower coefficients, the straightforward application of Davis' theory is fully justified and Uggla's theory is applicable only to very high loading coefficients, we will proceed according to Davis' theory. However reference will be made to Uggla's theory in certain exceptional cases.

The reaction of the grinding bodies on the lining. We assume that we are concerned with a rotating mill. The limits of the zone of stability are supplied by Davis' curves (Fig. 5).

There is only one Davis circle AB for the speed under consideration, and only one curve—CD. The number of possible circles BC is infinite, depending on the selected loading coefficient.

Amendments have been made to Davis' theory by various authors, including Von Steiger and Joisel, to allow for the fact that the crushing balls do not follow a free parabolic path once they have reached the outer limit of the compact mass (AB), due to the continued thrust exerted by the balls which follow them.

Thus, there are still some balls above AB that are no longer in contact with the lining which still exert action on that lining through the balls which follow them.

We make no allowance for this correction factor in the subsequent paragraphs. We will return to it later. For the time being, our main aim is to explain the method of operation of a phenomenon and the principles of a method of calculation of that phenomenon's effects.

Here is our problem: The crushing bodies in this area exert a certain action on the lining. This action results from the forces to which the bodies are subjected, force of gravity and centrifugal force. Does this action give rise to any opposite reaction? If so, what is this reaction?

The compact mass cannot be considered as being a rigid block. It is a deformable mass, which hugs and rests completely on the lining between points D and A. The effect on adherence of all the basic forces, which diverge considerably since they all pass through point M, is much greater than the effect of a single resultant. We must therefore consider the forces exerted at each point of the lining.

Please turn to page 190

Why the new LINK-BELT Series 50 belt conveyor idler starts saving you money right from the start

LOW FIRST COST is one of many savings offered by the Series 50 idler. Others include fast, easy installation . . . minimum power, upkeep and space requirements.

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New from base to ball bearings, the Link-Belt Series 50 idler is specifically designed for belt conveyors handling maximum loads of 100 lbs. per cu. ft. and moderate lump sizes. This addition to industry's most comprehensive idler line features smooth, balanced, concentric rolls with rounded edges for longer belt life. Yoke contour in sturdy, formed steel brackets and slot on shafts lock all brackets together in a rigid truss structure—won't spread under load.

For facts on the Series 50, see your nearby Link-Belt office or authorized stock-carrying distributor. Ask for Book 2516. For information on industry's most comprehensive belt conveyor idler line, get Book 2416.

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Textile-covered, flexible and resilient. Suitable for surface trunk lines and shallow holes where tensile strength and resistance to abrasion and cutting are not required. Tensile strength 125 lbs. 1000-ft. spool 17 lbs.

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BLASTERS AGREE that thunderstorms, high tension lines, power cables — even two-way radios — can be sources of stray electrical currents . . . and that these can cause premature shots under certain conditions.

The best safeguard against such hazards is to use a detonating agent which is insensitive to stray electrical currents.

In primary blasting, use Primacord as the detonating agent in each hole and also as the trunk lines to connect all holes so that they will fire in proper rotation. The entire blast can be detonated from one point on the trunk line — with fuse and cap or electric blasting cap. This final hook-up is made only when all is in readiness and when it is *safe* to fire.

In secondary blasting, use Detacord to prime each charge and to connect all charges, detonating it in the same way.

If your holes are primed with fuse and cap, connect the fuses with Quarrycord.

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AIR COMPRESSORS — Kellogg Division, American Brake Shoe Co. has published a 20-page catalog covering its line of ½ to 20-hp. air compressors for automotive and industrial use. The illustrated booklet gives specifications on single and two-stage models, portable models, tanks, pumps and accessories.

Enter 600 on Reader Card

BACKHOE—Ottawa Steel Division, L. A. Young Spring & Wire Corp. has brought out a bulletin describing its "Big Muscle" Ottawa industrial backhoe and front end loader, approved for mounting on the Minneapolis-Moline Co.'s Model 445 tractors. Design features and optional equipment are enumerated.

Enter 601 on Reader Card

BODIES, HOISTS—Gar Wood Industries, Inc. has a new 12-page catalog on its medium-duty dump bodies and arm-type hoists. Specifications for hoists with capacities ranging from 6 to 12 tons are outlined.

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CEMENT DISTRIBUTION — Fuller Co. has compiled in Bulletin G-4 a description of the operation of the cement distribution station of Olympic Portland Cement Co., Ltd., Harbor Island, Seattle, Wash. Bulk cement is unloaded from barge with Fuller-Kinyon remote control unloader and moved from silos to trucks and bag packers by F-H Airslide fluidizing conveyors.

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CHISELS — Bedford Tool and Forge Co. has prepared a complete catalog standardizing pneumatic and hand chisels by point style, body size and shank type. Pneumatic chipping chisels, scaler chisels, and round and oval collar retainer styles are listed and illustrated. Charts are used to list numbers and styles.

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CLAMPS, FITTINGS—Punch-Lok Co. has prepared Form Catalog 300RG-56, which, in addition to compiling its standard type hose clamps, grooved hose fittings and special tools and parts, is also an instruction and training manual. Especially detailed is the section on the Punch-Lok method, uses and applications.

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COMPRESSION TESTER — Soiltest, Inc. has compiled a technical manual, "Unconfined Compression Testing of Cohesive Soils," first in a series planned for engineering, laboratory and educational use. The 56-page book deals with the interpretation, application and limitations of the test data obtained as well as with procedures and testing equipment.

Enter 606 on Reader Card

COMPUTER—Bailey Meter Co. has brought out a brochure, Product Specification P99-3, which describes features, application and operating characteristics of computing relays for pneumatic control systems. Proportional, reset and rate control actions are explained and equations of computing actions are provided.

Enter 607 on Reader Card

CONVERSION CHART—Precision Equipment Co. is offering a wall chart of conversion factors, prepared for the benefit of engineers and others needing a ready reference table. Included are common conversions such as inches to centimeters, watts to horsepower, cubic feet to liters, as well as many unusual conversions, such as microns to meters and quintal to pound.

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COUNTER — Richardson Scale Co. announces Technical Reference No. 56-C, which introduces two models, 31-41-01 and 31-41-02 of a new electric counter. The units record up to 200 counts per minute, and can be used to count boxes, cartons, packages or individual objects as produced or conveyed past a checking point.

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CRACK INSPECTION — Magnaflux Corp. describes Spotcheck dye penetrant inspection in illustrated Form 16, 669. Distributed in pressurized cans, Spotcheck was developed for spray-on use to indicate cracks, seams, porosity and other defects open to the surface in parts, tools and materials.

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DRILLING — Joy Manufacturing Co. has published the second edition (Bulletin D-38) of "Do's and Don'ts for Diamond Core Drilling." The book contains more than 200 tips ranging from care of bits to use of wrenches. Sections on diamond bit recommendations for various geological formations and general information about diamonds also are included.

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DUMP TRUCK—Koehring Co. is distributing a new 24-page bulletin on the Dumptor, suggesting that hourly haul output can be increased by approximately 20 percent. Photos and drawings illustrate how this speed of operation can be accomplished by fast spotting, elimination of turns and one-second gravity dumping operation.

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DUST CONTROL — Johnson-March Corp. features its Chem-Jet dust control systems for metallic and nonmetallic mines in a bulletin recently released. Principles of the system are explained, and benefits enumerated which relate to safety and maintenance.

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FIRED REFRACTORY MATERIALS — Richard C. Remmey Son Co. presents an 8-page condensed catalog, RB-20, which covers 19 standard brands of its refractory brick. Classification, properties and applications of each are listed to simplify selection. Other Remmey products are given brief presentation.

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HIGHWAY PROGRAM—Caterpillar Tractor Co. has released Form D705 "The Road Ahead." The booklet was designed to provide a working knowledge of the future of American highways under the program inaugurated by the Federal-Aid Highway Act of 1956.

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INDUSTRIAL TRACTORS — John Deere Industrial Division is making available a 31-page booklet on its industrial tractors and equipment. Illustrations feature all models, as well as components and accessories. Action photos show suggested applications.

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MATERIALS HANDLING—Allis-Chalmers Manufacturing Co. announces two catalogs prepared by its Materials Handling Division. Bu-305 describes design, engineering construction and operating features of Allis-Chalmers fork-lift trucks, towing tractors and Chore Boy platform trucks. Bu-387 tells of clamping attachments available for the Allis-Chalmers lift trucks.

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MOTOR SELECTOR — Reliance Electric and Engineering Co. gives full information on selecting ac. motors for specific applications in the new 12-page Reliance Motor Selector, Bulletin B-2103-1. Data covers speed-frequency relationship, NEMA design classes, torque characteristics, NEMA current and torque values, frame selection tables and dimension charts and mechanical modifications for all frame sizes from 182 to 6085.

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PORTABLE HOISTS—Joy Manufacturing Co. announces Bulletin 3-69A, which features Joy single drum multi-purpose portable hoists. Descriptions and specifications for the Joy line of air, electric and gasoline-driven models are given.

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PULVERIZERS—Foster Wheeler Corp. is distributing a descriptive brochure on the Type MB planetary roll and table pulverizers. Developed in Germany, the pulverizer is offered in 10 models with nominal capacities of from 2 to 40 tph.

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ROLLER CHAIN—Link-Belt Co. has released Book 2454 presenting features of LXS bushed roller chain. Application and selection data, as well as principles of design, are detailed in the book.

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ROPE DATA—Union Wire Rope Corp. announces publication of Vol. 5 of Rope Dope Educational Bulletins. The bulletins provide information on the selection and specification of the right rope for the job at hand, care in its handling and installation, abuses to avoid and preventive maintenance.

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SCRAPERS—Euclid Division, General Motors Corp. describes three new Euclid scrapers and a new bottom-dump in literature just released. Models SS-18 and SS-24 are 18- and 24-cu. yd. tractor scrapers featured in Form 508 and 509; S-12 overhung engine bottom-dump, in Form 220; and TS-24 24-cu. yd. twin power scraper, in Form 553.

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SHOVELS, SCRAPERS — Allis-Chalmers Manufacturing Co. is distributing several pieces of literature prepared by the Construction Machinery Division. Forms MS-1137 and MS-1126 provide information on the HD-11G and HD-6G diesel-powered crawler tractor shovels. MS-1149 features four pull-type scrapers. MS-1104 details features of the TS-360, 20-cu. yd. scraper.

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STAINLESS STEEL — Allegheny Ludlum Steel Corp. is offering a new publication, "Stainless Steels Types 308, 309 and 310," containing detailed information on physical properties, heat treatment, strength at elevated temperatures, fatigue strength and resistance to oxidation. Suggested applications of the steels are in furnace parts, boiler baffles, fire box sheets, oven linings, still tube supports, pump parts and kiln linings.

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SYNTHETIC RUBBER—E. I. duPont deNemours & Co., Inc. has released Booklet A-2972 on its neoprene and Hypalon synthetic rubbers. Properties and uses are detailed in the illustrated 15-page book, and charts outline their chemical resistance.

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TRACTOR OPERATION — Caterpillar Tractor Co. has released Form 32109-DE636 explaining from the operator's standpoint the care and handling of Caterpillar No. 977, 955 and 933 traxcavators. Another brochure, Form 717-32460-D713, pertains to four tractor models, D2- D4 and D6 enumerating various industrial applications.

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TRACTOR TOOL — Hyster Co. has prepared Form 1437 featuring its ½-cu. yd. D4 backhoe. The hydraulic unit is designed specifically for use with Caterpillar D4 tractor.

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VIBRATORS—Martin Engineering Co. is distributing a 36-page catalog on the Peterson Vibrolators for high-speed movement of granular material. Pictorial and editorial description covers range of models, their characteristics and applications. Specifications and performance data are listed.

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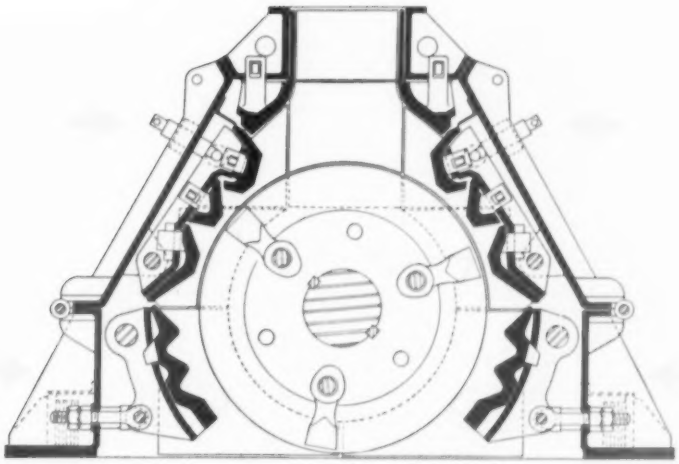

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Here's another Pennsylvania original that is a great contribution to more economical and efficient crushing.

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Bath Iron Works Corporation **West Chester, Penna.**

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cut operating costs

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assure uniform product during longer life of hammers

* Patented

PENNSYLVANIA
REVERSIBLE IMPACTORS

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Syntron "Vibra-Flow" Vibratory Feeders with variable control rate of materials flow will match the capacity of your processing equipment—increase production. SYNTRON Vibratory Feeders are applicable to most any bulk materials handling problem. They provide a smooth, even flow of bulk materials, whether it be sand, gravel, limestone, sandstone or metallic ores, to screens, conveyor belts, pulverizers, crushers and other types of equipment.

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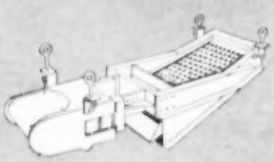

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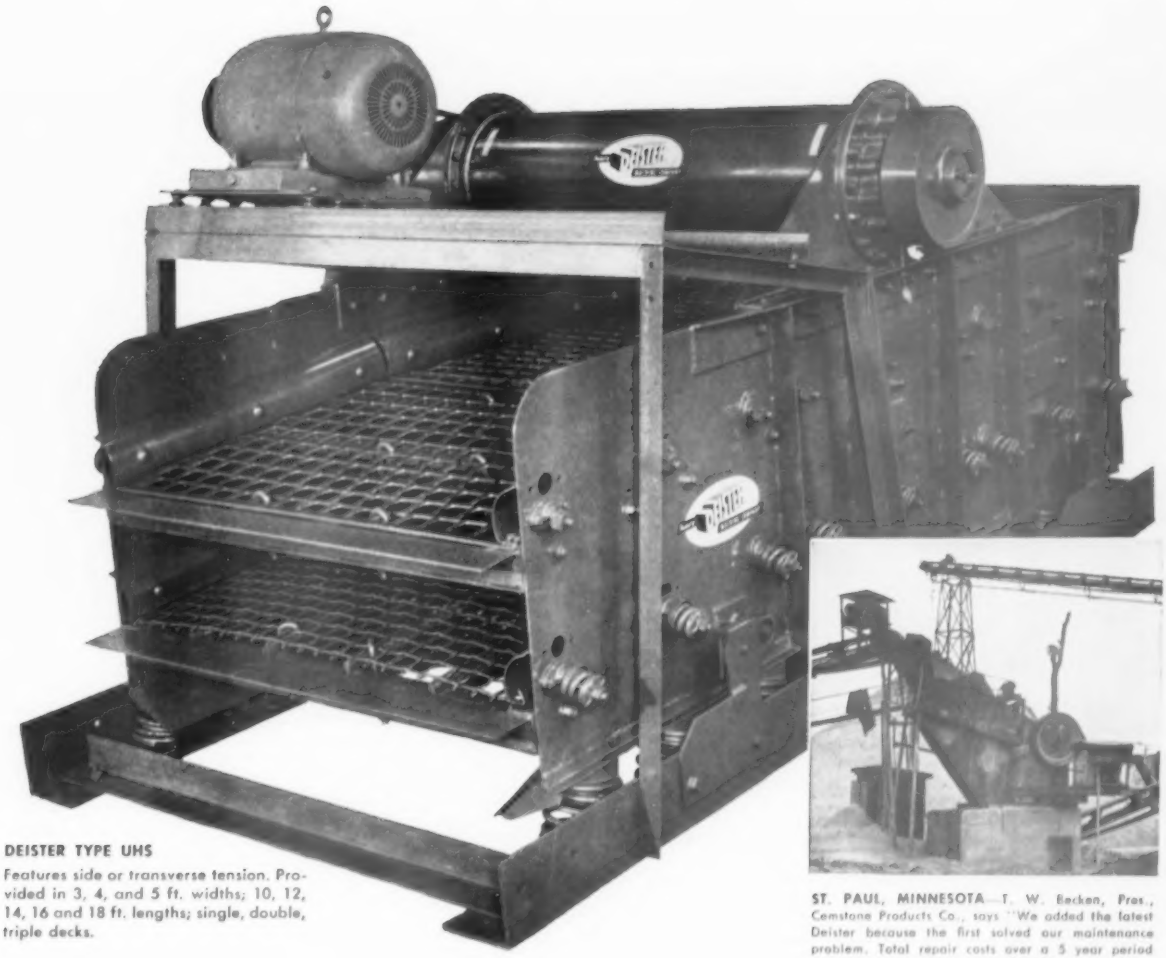

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SOUTH ZANESVILLE, OHIO—Five Deister Screens help Sidwell Bros. produce up to 300 tons per hour. Says Carl Sidwell "Deisters make good, dependable, efficient screens. We've had real service from ours . . . that's why, when we needed more capacity we bought two new Deisters."

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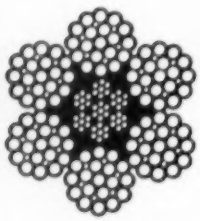

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5078

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Who is exempt from overtime pay and who is not?

How do you solve that **overtime** problem?

By ROBLEY D. STEVENS*

WHY MAKE OVERTIME PAY MORE expensive than it already is? Your familiarity with the federal wage-hour law, accurate, up-to-date record-keeping and a periodic audit of your payroll will help keep overtime costs down and avoid needless litigation, criminal action or wage suits.

It is a sound dollar-and-cents policy for every employer in the rock products industry to be sure that he is meeting the basic wage-hour requirements. Some employers have been ordered to pay back wages because they were not aware of the basic rules.

In substance, the Fair Labor Standards Act states that anyone covered by the law must be paid overtime for work beyond 40 hours per week. The question is: Who in your company is covered and who is not? It can only be settled by comparing the job functions of each worker to the official simplified "tests" of duties, salary and other requirements for eligibility. The language of these wage-hour "tests" is exclusionary; that is, anyone in your company whose job measures up to **all** the requirements is **not** officially entitled to overtime and **is** exempted from the regulations.

Employes are not exempted because they have impressive titles or are paid a good salary. In brief, for the exemption to apply, it is the individual's duties which should meet the "tests" laid down by the wage-hour regulations. Two classifications of supervisory exemptions are presented:

1. An Executive Supervisor is one: (a) whose primary duty is the management of the company that employs him or a recognized department; (b) who regularly directs the work of at least two full-time employes; (c) who can hire or fire, or recommend hiring or firing, or whose suggestions in regard to hiring or firing are given particular weight; (d) who regularly exercises discretionary powers; (e) who devotes no more than 20 percent of his workweek to nonexempt work and (f) whose salary is at least $55.00 a week.

For quick reference the following applicable **short test** may be used: An executive supervisor who earns at least $100.00 per week is **exempt** if (a) he regularly directs the work of at least two full-time employes and (b) his primary duty is management of the company or a department.

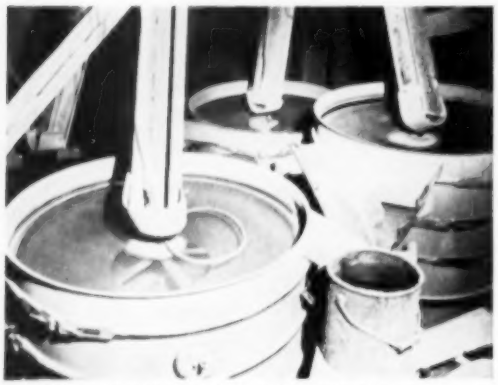
2. An Administrative Supervisor is one: (a) whose primary duty is responsible office or nonmanual field work of substantial importance to management or operation of the company; (b) who customarily and regularly exercises discretion

*Management consultant

Maiden Rock Co. Sizes Sand to 98% Accuracy with Six 48" SWECO Separators

Six 48" diameter SWECO Vibrating Screen Separators are sizing sand into three main classifications – in a process approaching 98% accuracy – for Maiden Rock Silica Sand Company of Maiden Rock, Wis. The accepted commercial tolerance in this area is 85%.

Maiden Rock's sand production is classed as minus 10 plus 30 mesh, minus 20 plus 40 mesh, and minus 40 plus 60 mesh. These special size requirements are easily handled by simply changing the screens on the SWECO Separators. Screen life with this abrasive material averages from four to six months and maintenance costs have been considerably less than they were with other screening equipment.



Close "nesting" of SWECO Separators in screen room of Maiden Rock Silica Sand Company takes minimum floor space. Efficiency of the units is not hampered.

By improving quality and providing the accurate separation its customers require, Maiden Rock has boosted demand for its sand products. The company is replacing all other types of screening equipment with efficient SWECO units that lower maintenance costs and increase production capacity.

Screening Analysis and Recommendations Available

Your nearby SWECO District Engineer is available to help you with special screening problems. His "know-how" covers over 200 different materials...wet and dry, coarse and fine, heavy and light. He has an 18" SWECO Separator available, to demonstrate in your plant how this equipment can screen your material. No obligation, of course.

A complete data file on screening rock products plus a 22-page catalog are yours for the asking. Write for Bulletin S-107-14.

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Overtime

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and independent judgment, as distinguished from using skills and following procedures. He must have the power to make important decisions; (c) he must spend no more than 20 percent of his work week on nonexempt work, that is, work not closely related to his administrative duties; and (d) he must earn at least $75 a week in salary.

The following **short test** also may be applied for quick reference: An administrative supervisor who earns at least $100 a week is **exempt** if (a) his primary duty consists of responsible office or nonmanual field work of substantial importance to management or operation of the company and (b) his work requires the use of discretion and independent judgment.

Examples. Equally important to understand is that the primary purpose of the exclusionary language—placing a limitation on the amount of nonexempt work—is to **distinguish** between the **bona fide executive** and the **working supervisor** or foreman who regularly performs **production** work or work only remotely related to his **supervisory activities.**

One type of **working** supervisor or foreman most commonly found in industry works alongside his subordinates. Such an employe, sometimes known as gang or group leader, performs the same kind of work as his subordinates and also carries on supervisory functions. Work of the same nature as that performed by the subordinate should be counted as nonexempt work and, if the amount is substantial, the exemption can not be used.

For example, a supervisor or foreman who operates a machine in the production or manufacture of rock products is considered to perform nonexempt work. But this should not be confused with the operation of a machine by a supervisor or foreman to **instruct** his subordinates before going into production on nonmetallic products.

Another type of **working** supervisor who can not be classified as exempt is one who spends a substantial amount of time in work which, although not performed by his subordinates, consists of ordinary production work or other routine, recurrent, repetitive tasks which are a regular part of his duties. Such an employe might be tion. His nonsupervisory duties in such instances he may be a supervisor-clerk, or a combination foreman-production worker whose job is combined with some other skilled or unskilled occupation. His non-supervisory duties in such instances are unrelated to anything he must do to **supervise** the employes under him or to manage a department. They are, in some instances, mere "fill-in"

tasks performed because the job does not involve sufficient executive or supervisory duties to occupy his full time.

There is no doubt that the head bookkeeper who spends a substantial amount of his time keeping books of the same general nature as those kept by other bookkeepers — even though his books are confidential in nature or cover different transactions from the books maintained by the under bookkeepers—is not primarily an executive employe and, under the rules laid down, should not be so considered.

An office manager who does not **supervise** two or more other employes would not meet the requirements for exemption as an executive employe but may possibly qualify for exemption as an administrative worker.

It is not necessary to emphasize the fact that the federal wage-hour regulations do not exempt all employes. It is natural that supervisors and foremen prefer to be classed as a part of the management team—most of them are. The job performance must meet all tests laid down by the wage-hour regulations for exemption. In brief, job titles are insufficient as yardsticks for exempting any individual worker from overtime pay after 40 hours weekly.

Your company should keep in mind that these requirements apply to employes who are engaged in **interstate** commerce or in the production of goods for interstate commerce, including **occupations** closely related and directly essential to such productions. The interstate activities of most companies in the rock products industry bring their employes within the scope of the federal wage-hour law. However, any one of the foregoing workers can be sure that he is qualified for exemption by answering "yes" to the series of tests mentioned above.

Record keeping. Every employer must keep time and payroll records under the wage-hour law. No particular form or order is required. An investigator's first contact with an employer is through an audit of the records, and inaccurate or incomplete records could prove costly.

A simplified breakdown of the identifying information that should be in your records follows: (a) employe's full name; (b) his home address; (c) his social security number; (d) the occupation in which he is employed; (e) time of day and day of week his work week begins; (f) total hours worked daily or weekly; (g) basis on which wages are paid; (h) legal deductions from wages paid; (i) total wages paid each pay period and (j) date of payment and pay period covered by payment.

Other pointers. Although this list may seem

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Overtime

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long, most of it is required under the wage-hour rules. It should be kept in the interest of sound business practice.

Many executives and supervisory workers are on a fixed working schedule. In such a case, the employer should keep a record showing the exact schedule of daily and weekly work hours that the employe is expected to follow. Your company should keep all records with the required information for three years, and hold the data on which wage-hour computations are based for two years. These include time cards, wage-rate tables, work-time schedules and records of additions to and deductions from wages, as well as order, billing and shipping information.

Naturally, records must be open for official inspection because an investigator may request your company to make extensions, recomputations or transcriptions.

The expanded coverage of the federal wage-hour law is strikingly pointed out by the fact that an employer in this industry may subject himself to wage suits brought about by an executive or administrative supervisor or foreman not found officially exempted. Double damages are a probability for the alleged back wages found due by the inspector.

Tips or complaints may arise from many sources —competitors, labor unions, employes and exemployes. Aside from this, **reinspection** may occur at any time.

Overtime is expensive enough without making it more so by **misclassification** of your employes. Each employer must of necessity work out his own system of compensation. The above pointers are an important sampling of things you should know when qualifying your supervisors and foremen for the exemption status.

END

Cement plant expands

continued from page 92

Clinker grinding. The clinker grinding section shows more evidence of change than any other portion of the mill. The three original clinker mills were identical with the original raw grinding mills, except that they were installed for dry grinding instead of wet. They are now used entirely for grinding Type I and Type II cement, while two new 8½ ft. x 39 ft. three-compartment mills are used almost entirely for grinding both masonry cement and high-early-strength cement.

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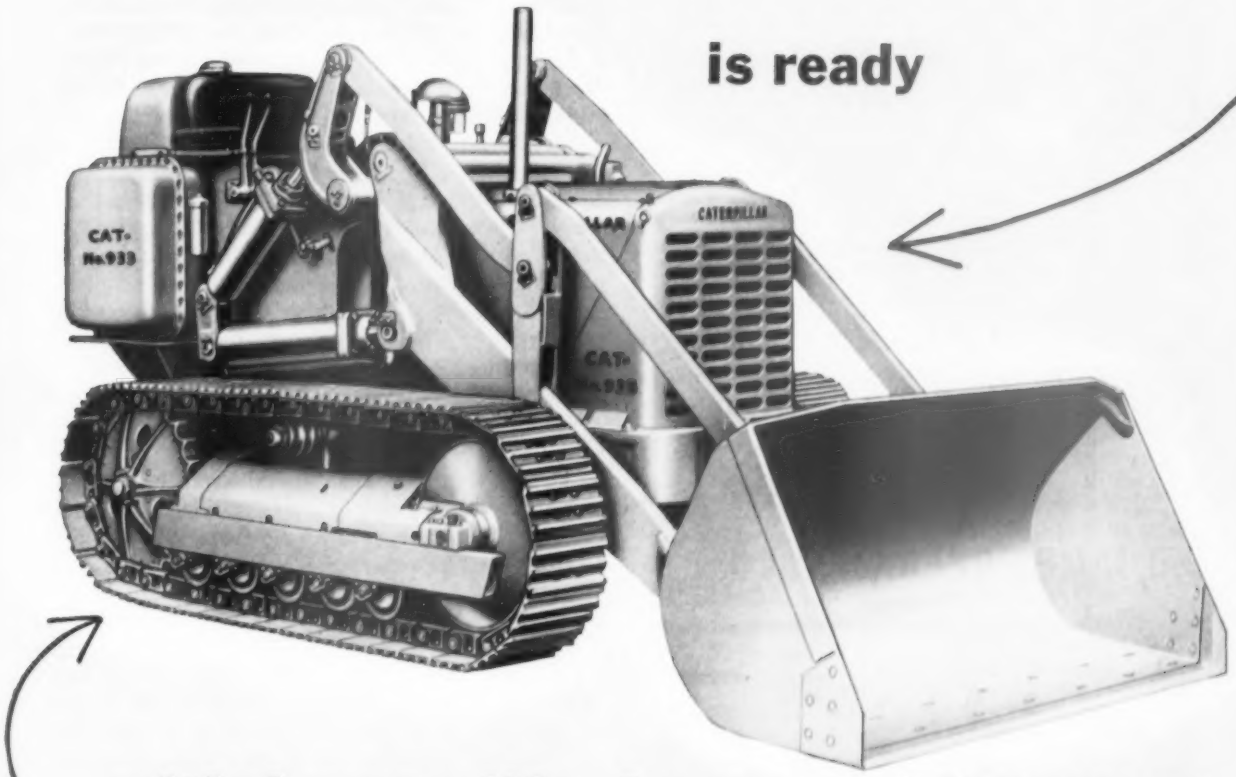
ANNOUNCEMENT! The new, improved

No. 933 (Series E) TRAXCAVATOR*

is ready



with longer life, lower maintenance!

Looks a lot like the popular No. 933 you already know—but there's greater stability, performance and durability built into this new Series E!

Now the rugged CAT* No. 933 Traxcavator includes a new heavy-duty undercarriage with:

- New Rugged Track Roller Frame
- New Solid Sprockets
- New Heavier Idlers
- New Tough Track Rollers

The complete line of Cat-built Traxcavators	No. 977	No. 955	New No. 933 (Series E)
Flywheel HP at sea level	100	70	50
Bucket capacity, cu. yd.	2¼	1½	1
Bucket tip back at ground level	40°	40°	40°
Bucket tip back at maximum lift	46½°	47½°	48°
Dumping height (center of hinge pin to ground)	141½"	128"	119 1/16"

The easy operation, the great capacity and the dependable power—these features remain as outstanding as before.

For complete details on this *tough* new Traxcavator, call your Caterpillar Dealer. He'll be glad to give you full information on the complete line of Cat-built Traxcavators. He's the man to remember, too, for expert service and for replacement parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

Cement plant expands

continued from page 174

Like the original 15-ft. mills, the three-compartment Unidan Mills grind in closed-circuit with 16-ft. Sturtevant air separators, and they are also fed by means of Schaffer Poidometers. The Poidometers that feed the new mills are controlled by the load on the drive motor of the elevator which carries the discharge of each mill to its air separator. Thus, if an elevator starts pulling hard, the Poidometer in its circuit automatically slows down until the load drops back to a predetermined level.

Because of the finer grinding they are required to do, cooling has been something of a problem with the new clinker mills. After much experimentation, the No. 5 (newest) mill was ordered with an F. L. Smidth internal waterspray system on the discharging end.

Where the original installation made use of screw conveyors for handling the products of the finish mill, the more recent installations have made extensive use of Fuller-Huron Airslides. The units carry mill discharge to the elevators, from the elevators to the separators, and they handle fines and tailings from the separators.

Storage and packhouse. The original storage system for finished cement, consisting of a battery of 24 concrete silos, has been doubled in the course of carrying out the two expansion programs. The 48 silos that comprise the present storage system have a total capacity of about 400,000 bbl.

In the packhouse three additional supply bins have been built and the bag storage space has been increased somewhat. The three original St. Regis four-spout bagging machines are still in service.

The installation of a second track scale, a Streeter-Amet electronic unit, now makes it possible to weigh cars on either side of the storage silos—thus saving a good deal of time and facilitating switching operations.

Miscellaneous facilities. The two expansion programs carried out during the short operating history at Bunnell have necessarily involved the addition of some auxiliary facilities. A special building, for inactive storage of kiln brick and large replacement parts, has been extended, as has also a truck garage.

A Hewitt-Robins car shakeout has been installed to speed the unloading of such incoming raw materials as staurolite, iron slag and gypsum, and a third overhead bridge crane is to be installed in the long building used for storing raw materials and clinker.

Continued on opposite page

Cement plant expands

continued from opposite page

With four high-capacity kilns now installed and in full production, Lehigh enjoys an enviable position in the booming economy of Florida. Overnight delivery service can now be virtually guaranteed to most of the company's major markets in central and north Florida, and the tremendous productive capacity which has been provided promises to be equal to any demand likely to develop in the near future.

It requires a total force of about 300 men to operate the present four-kiln plant at full capacity —about 130 more than were on the payroll when the two original kilns were first fired in November 1952. After three years of continuous involvement in a major expansion program, Lehigh's fine team at Bunnell is reported to be looking forward to a few years of concentrating their full attention on production problems.

END

Liquid cyclones

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The most significant feature of the balanced cyclone installation has been the ability of the units to make the desired separation at the low feed inlet pressure of 11 psi. Cyclone pump power requirements have dropped to .16 kwh. per ton of feed plus circulating load, while pump wear declined accordingly. Both unit B cyclone pumps have handled an estimated 650,000 tons of minus 10-mesh material without trouble during five months of service.

Tests have been made continually with several different types of control devices in an effort to improve the operation of the cyclones.

The apex valves are the only part of the cyclone unit that show any appreciable wear. They are made of molded natural rubber and normally last about 100 days. Several types of hydraulic and pneumatic controls have been installed in an attempt to compensate for wear and to maintain a fixed orifice diameter. The pneumatic type valve appears to be quite successful to maintain a fixed orifice. It remains to be seen whether it will provide for a longer useful life of the rubber valve.

An apex valve with ceramic insert is another innovation that shows promise. It is hoped that this extremely hard, high temperature, superceramic material will serve to maintain a fixed diameter for a long period of time. This type of

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Liquid cyclones

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valve has been on test for only a short time; it is far too early to make any predictions whatsover on its performance.

The operation and principle of liquid cyclones is new to the production and operating staff at Calaveras Cement. A vast amount of knowledge and know-how has been picked up along the way in becoming acquainted with the operational advantages of this valuable new tool.

One of these was the ability of the machine to overcome the natural antagonism of the mill operators toward anything that is new or different or which tends to deviate from the normal pattern of past operation. One of the reasons the cyclones were so readily accepted as a part of the everyday plant operation is that they require so little care and attention from the operators. To be able to place these machines in a plant circuit and have them quietly go about doing a job with a minimum amount of care and supervision is certainly a feature designed to win the respect of operator and maintenance man alike.

Table 3
Cyclone data Unit B
Combined results

Mesh	Feed (Calc.) % Weight Direct	Feed (Calc.) % Weight Cumulative	Overflow % Weight Direct	Overflow % Weight Cumulative	Underflow % Weight Direct	Underflow % Weight Cumulative
10	.08	.08			.18	.18
14	.16	.24			.38	.56
20	.65	.89			1.52	2.08
28	1.67	2.56			3.90	5.98
35	3.70	6.26			8.64	14.62
48	4.39	10.65			10.23	24.85
65	5.45	16.10			12.67	37.52
100	7.14	23.24	tr.	tr.	16.64	54.16
150	8.36	31.60	2.14	2.14	16.64	70.80
200	8.96	40.56	9.42	11.56	8.35	79.15
—200	59.44	100.00	88.44	100.00	20.85	100.00
	45.6% Solids		34% Solids		71% Solids	
	932 gpm.		728 gpm.		204 gpm.	
	152.3 tph.		86.9 tph.		65.4 tph.	
	Feed Inlet Pressure 11 psi.		Vortex 5¼ in.		Apex 2⅝ in.	

One of the advantages expected from the use of cyclones was the ability to produce an increased tonnage of ground material for delivery to the slurry thickeners at a materially higher density. This would reduce the volume of material to be pumped, and make it possible to pump larger tonnage through the existing pipe lines. The large quantities of water required by the bowl classifiers to make the desired separation at approximately 88 percent minus 200 mesh produced a finished slurry at 12 to 15 percent solids; a ratio of solids to water of about 1 to 6.5. The transporta-

tion of this large volume of solids and water to the thickeners imposed a severe load on pumps, pump motors and pipe lines that had been installed at an earlier date when production rates were at a substantially lower figure. With an increase in production of 35 percent the only alternative to duplicate pipe lines and pumping equipment was to produce a slurry at a higher density and to reduce amount and volume of water pumped.

This was attained by the application of the dynamic classification principle of the liquid cyclones. A finished ground material was produced within the accepted limits of size distribution with a density of 35 percent solids, or a solids to water ratio of 1:1.9. This resulted in the net of 4.6 tons of water for each ton of solid material handled. A gain in pumping economy is achieved not only in pumping slurry to the slurry thickeners but in handling a lesser quantity of thickener overflow water back to the plant process.

Table 4
Comparative Pump Performance Data
Circuit A

	Mechanical Classification	Unit A Cyclone Classification	Unit B Cyclone Classification
Tons per hour—feed	70	100	100
Slurry to Thickeners—			
Percent Solids	13.5	35	35
Ratio—Solids : Water	1:6.4	1:1.9	1:1.9
Pulp Volume per ton Solids—cu. ft.	216.9	71.4	71.4
Total Slurry—gpm.	1900	892	892
Feed Increase—percent		43	43
Gpm. Decrease—percent		53	53
Total Pumping Load—hp.	117	126	84
Total kwh. per ton of feed	1.213	.939	.627
Power Decrease—percent		22.6	48.4

Table No. 4 lists the pertinent information to be considered in making a direct comparison of pump performance between conventional mechanical classification and cyclone classification. The advantage of liquid dynamic classification can be more readily appreciated since approximately 43 percent more weight of material is now being successfully processed at a reduction of 53 percent in volume of slurry. The increased tonnage is being handled with a net power saving of from 23 to 48 percent.

The Calaveras Cement Co. fully anticipates that there will be continued improvements in operating technique. As more know-how is acquired through trial and error, even greater savings will be realized in the processing of larger quantities of raw material at substantially lower costs per ton of finished material.

END

●

SICILY ISLAND GRAVEL CO. INC., Sicily Island, La., has been granted a charter. Capitalization of $100,000 was authorized.

Instrumentation

continued from page 142

as 10 to 14 percent excess air in exit gases, meaning serious heat losses in the stack. Operators of coal-fired kilns report ring build-up in less than 20 min. when oxygen gets too low.

Further control system refinement can provide for automatic control of fuel-air ratio by resetting hood draft.

Speed measurements. The advantages of maintaining constant kiln speed are readily apparent. Throughout time can be accurately determined and the necessary adjustments made in the time-temperature cycle. Feeder speed can then be set to maintain the desired flow of raw material into the kiln.

Accurate tachometers and modern electronic speed recording instruments provide the means of allowing the kiln burner to keep continuous check on these two variables.

Multiple point recording. Many plants rely on multiple point continuous strip-chart instruments to measure and record temperatures throughout the kiln system and to supply accurate records of these variables for later study. Modern high-speed multiple-point recorders can measure 10 separate remote temperatures in as little as 20 sec. as contrasted to older mechanical recorders requiring as long as 10 min. These newer instruments thus print a more accurate record of operating conditions and enable kiln burners to make adjustments quickly to head off serious operational upsets.

They can also be adapted to automatically control temperatures at one or more points.

Materials handling. Recent advances in the use of electronic load cells for weighing and batching, and the use of motor load control in the grinding operation, have brought the advantages of automatic instrumentation and control to these areas of the plant operation. Often these functions are serious "bottlenecks" to increased production. In one plant, automatic motor load control on one raw grinding mill system increased production enough to pay for itself in less than 10 days.

Monitoring systems. A unique monitoring system has been made available that can daily save hours usually spent preparing comprehensive operating reports for plant operating management and home office executives.

Please turn to page 183

"We built our entire plant around our Manitowoc shovels"

G. L. Schuster, Superintendent

Dubuque Stone Products Co.
Dubuque, Iowa

This midwestern quarry relies on two husky Manitowoc Model 2000 shovels to keep an average 125 tons of all-sized crushed stone going through its plant every hour. "Our primary crushers," said Superintendent Schuster, "will take every rock that will go through the Manitowoc's 1¼-yd. dippers. The place to really break stone is in the quarry and that is the basis of our operation with the Manitowocs . . . blasting as we do, between 50,000 and 80,000 cubic yards at a time!"

350 Tons Per Hour

In addition to feeding the crushers, the two shovels often handle as much as 350 tons an hour straight from quarry blasting to railroad cars. "Actually," Mr. Schuster explained, "our manufacturing schedule is set up on the basis of 35 minutes to the rail car. Whether the stone is straight from the quarry or from the crusher, we still call upon the shovels to handle seven dippers per truck load at 2,500 to 2,700 pounds for each cycle."

"What we need in a shovel," said the superintendent, "and what the Manitowocs give us, is a 'delicate feel'—the placing of the dippers for both the stone and the boulders. For instance, the operator very seldom has to retrack once he sets in. This is a definite advantage because boulders and rock are massed together after blasting and simply grabbing for a dipperful could cause a slide or make top boulders drop down with damage to the machine itself."

50 Cars a Day

"With the two Manitowocs digging," Mr. Schuster noted, "We can fill as many as 50 rail cars a day . . . with 50 tons of stone per car. In addition, we send out an average of 1,000 tons by truck per day. That means we load approximately 8,000 rail cars per year. And every ounce of this stone is handled by our two Manitowocs!"

Low Upkeep

These rigs work eight hours a day, five days a week. Even with this heavy schedule, service and maintenance costs are negligible. Both shovels are operated on 25 gallons of diesel fuel a day and are greased twice daily.

The original swing band is on the first machine purchased. This rig was purchased in 1948 and as Mr. Schuster says, " . . . is operating as good today as when new. We have been so pleased with it we eventually ordered the second one from Manitowoc.

"One of the features we like best is the lighter dipper stick which gives us an average use of 6 to 8 weeks' work from our hoisting lines."

Excellent Service

"Summing up the picture," the superintendent said, "what we like about the Manitowocs and the benefits we get from them can best be expressed by the fact that no matter how good the equipment is, you cannot buy service — and *service is what we get* from the Manitowoc people!"

Get all the benefits of superior Manitowoc performance in *your* quarry or pit. A call to your Manitowoc distributor will bring full information and specifications.

Manitowoc Engineering Corp.
Manitowoc, Wis.

MANITOWOC
SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

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The BIG SCREEN for the BIG JOBS

ALLIS-CHALMERS SCALPING SCREEN

FIELD TESTED FOR 3 YEARS

- **Engineered to Handle the Toughest Job in Any Rock Products Flow**
- **Extra-Large Mechanism**

HERE'S an *extra heavy duty* screen built to take punishing loads coming from your primary crusher. Its rugged cartridge-type, oil-lubricated mechanism features giant bearings — the largest ever installed in a vibrating screen. The heavy I-beam and channel-constructed screen deck support frame can withstand impact of large pieces and high tonnage.

Reduced Maintenance — Simplified two-bearing cartridge mechanism can be pulled out after removing sheave and four bolts. Large size bearings mean extended life, less frequent replacement.

Vibration Isolation — Standard design includes multi-unit vibration *isolators* — two per corner, each with an inner and outer spring arrangement. Vibration to building or structure is isolated even when sticky materials adhere to the screen.

For complete information, see your A-C representative or write for Bulletin 07B8368, Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5063

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Instrumentation

continued from page 180

This system consists of a multiple point strip chart recorder installed on the central control panel. It is connected through a calibration box to the instruments measuring 10 important variables; firing, cooler and backend temperatures, exit gas 0_2 content, kiln speed draft and others. Continuously throughout the day this instrument prints a record indicating the performance of each variable and its deviation from optimum operation.

Once each day the recorder chart for a 24-hr. period is torn from the roll. By comparing the data on this single square foot of chart paper with a previously prepared auxiliary table, plant operating conditions are quickly determined.

Centralized control. While any of the foregoing instrument or control systems can be individually applied to kilns, the trend today is toward integrated centralized systems designed and constructed by one manufacturer. These systems put all the necessary recording and controlling instruments, switches, push-buttons and meter on one single panel convenient to the burner. The labor savings are instantly apparent, and the savings because of stable kiln operation are very quickly realized.

Automatic control. Complete automatic control of the kiln operation is the goal of most operators. And this goal is nearer than some have realized. Difficulties have been experienced in the past with automatic control mainly because there are so many and such a variety of functions occuring at a given time. And the inaccuracies of older instruments and control systems failed to paint a true picture of the kiln operation.

Continuing field trials of the latest electronic instruments have pointed the way to automatic control and today there are numerous systems in operation throughout the country.

Make no mistake, automatic control is not a "plug-in cure-all" for rotary kiln difficulties. But with close cooperation between plant engineers and the design and field personnel of the instrument manufacturer, automatic control systems are a practical reality that can up-date your older kiln operations and insure the investment that must be made for new plant facilities.

END

New Nigerian Plant

THE NIGERIAN CEMENT CO. LTD. has been granted a limestone mining lease on 7,000 acres at Nkalagu in Ogaja Province. The company is erecting a plant for cement manufacture. A railway spur has been built, extending from the plant site to Ogbaho on the Eastern Line.

Fort Lauderdale was again the setting for the annual meeting of Vermiculite Institute

C. H. Wendel, new president

Vermiculite Institute explores new markets, applications at annual meeting

THE POTENTIAL OF VERMICULITE in the construction field was thoroughly explored and new uses for the material were indicated when Vermiculite Institute held its 16th annual meeting at the Lago Mar Hotel in Fort Lauderdale, Fla., April 6-11.

Application of vermiculite in concrete roof construction was given a day on the convention program. "Roof Deck Day" was devoted to discussions opened by C. H. Wendel, new president of Vermiculite Institute and president of California Zonolite Co., Los Angeles. Mr. Wendel stressed the importance of employing technically trained special representatives to work with applicators, architects and engineers. C. R. Babb, Zonolite Co., St. Louis, Mo., advised members on the selection and training of roof deck applicators.

R. W. Sterrett of Chicago, chairman of the institute's concrete committee, presented a new institute publication summarizing results of a test program to demonstrate the adequacy of vermiculite concrete as a horizontal diaphragm in earthquake zones. The five panels of vermiculite concrete which were tested showed a high safety factor in resisting earthquake loads.

Also presented by Mr. Sterrett was a report from the International Conference of Building Officials, recommending a 1:4 mix of vermiculite concrete over form board as a satisfactory structural roof deck alternate to materials specified in the Uniform Building Code.

During the year the concrete committee prepared the first industry-wide procedure for sampling and testing vermiculite concrete for roof fills, roof decks and floors. Copies of this procedure were distributed to all the delegates.

C. A. Pratt, vice-president of Western Mineral Products Co., Minneapolis, Minn., discussed the application of vermiculite concrete roof decks. He reported that the vermiculite industry's sales of concrete aggregate for precast products increased 71 percent during the past four years. Total sales of this aggregate increased 50 percent in the same period. He noted that the trend in the industry has been towards appointing well trained applicators to install vermiculite decks.

The Army Corps of Engineers' execution program for construction on a world wide basis involves $1.6 billion for this year, Harry Zackrison, chief of A.C.E.'s engineering division, told the delegates. Much of this provides heavy construction, he noted, but there is still a substantial volume of building construction in which products such as vermiculite have an opportunity to be used. This includes lightweight plaster as well as concrete.

Vermiculite has been used both in precast insulating roof slabs and as insulating roof fill in the development of the design for military structures, Mr. Zackrison said.

"We in the Corps of Engineers have been most interested in the research programs that the Vermiculite Institute has been carrying on since 1954 on built-up roofing over vermiculite roof decks," he stated. "I am sure it will be of interest to you to know that somewhat similar studies have been in progress at the National Bureau of Standards under our sponsorship since 1954."

Another major use of vermiculite in military installations has been for insulating underground heating conduit.

"We are also making a comprehensive study of underground steam con-

(Continued on page 186)

By using Extremultus transmission belting, take-ups have been eliminated and center distances reduced on this 110 h.p. dragline winch drive in a potash mine.

BELT TAKE-UPS ELIMINATED!

Down time losses due to transmission belt stretch plagued this potash mine. Potash was removed by a cable winch dragline from a 2,300 foot depth, powered by a 110 h.p. induction motor, with its punishing, sporadic high torque. Atmospheric conditions were hot, dry, dusty. Leather, rubber and camel back transmission belts were tried and failed. Finally, an Extremultus transmission belt was put on the drive, and three months trial passed without one take-up. Even after the trial period, the Extremultus transmission belt remained as tight as the day of installation, solving the costly, exasperating take-up problem.

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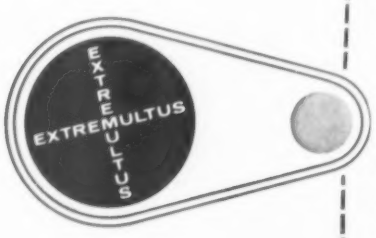

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VERMICULITE MEETING

(Continued from page 184)

duit insulation at the Bureau of Standards," Mr. Zackrison said. "These also simulate in-place conditions. Some of the results are startling. The tests are not yet completed and will probably take a year or two more before we can report them, but I think they will prove of considerable interest to your institute."

Mr. Zackrison expressed appreciation for help extended to the Corps of Engineers by the institute's technical staff, and commended the institute on its representation on various technical committees of the American Concrete Institute, A.S.T.M., etc.

Stanley K. Robinson of Montreal, chairman of the institute's insulation committee, reported that the Federal Housing Administration passed an important ruling during the past year which permits vermiculite insulation to be installed in attics of homes throughout the nation without the requirement of a vapor barrier where proper ventilation is provided.

A growing use for vermiculite, disclosed by a recent survey, is to insulate hollow core blocks. Mr. Robinson said. Regardless of the type of aggregate used in making the block, filling the cores with vermiculite will double the insulation value of the wall, tests are said to have shown.

In the election of officers, Mr. Wendel was chosen president to succeed Harvey W. Steiff, vice-president of Western Mineral Products Co., Minneapolis, Minn. William V. Culver, manager of Vermiculite - Northwest, Inc., Seattle, Wash., was named to the board of directors.

Edward R. Murphy was returned as managing director and Walter J. Bein, vice-president of Zonolite Co., Chicago, Ill., was re-elected treasurer.

END

ROCKY'S NOTES

(Continued from page 15)

mixed group. It turned out that the Y.W.C.A. was about the only place they could meet.

Here we should preface what follows; that John, like many of the rest of us, had by that period to resort to dentures in place of his original teeth. They were new, and as is common experience, he had not learned to manipulate them satisfactorily. We hardly need to remind experienced readers that under such circumstances it is a little embarrassing to attempt to make a speech or to speak at all in public.

Nevertheless, John had a civic duty to perform, and he was not one to shirk civic or any kind of humanitarian duty. He rose to make the introduction of the reverend colored gentleman on his right, but when he opened his mouth his teeth popped out of place! He hastily covered his mouth with a napkin and retired to the washroom to replace them. Thereafter the meeting proceeded without incident, and according to John, without much result. For it was subsequently learned that Negro preachers and colored gentlemen of the cloth generally, had little influence with their own people. The politicians, both white and black, did. Those who have read about Kansas City politics of that time, when one of our recent U. S. ex-presidents was learning the ropes, can well understand the situation.

Knowing John, as we did, we knew that "his most embarrassing moment" was not so much embarrassment on his own account as his concern for the embarrassment of his colored guest. We could rest assured that he passed the incident off with humor and understanding, just as he could retell it to us.

(Continued on page 190)

Announcing the all-nylon

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FOR MINES

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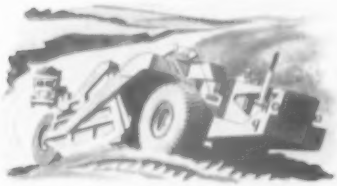

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Reno, Nevada is site of regional conference

Heavy media separators, liquid cyclones discussed at A.I.M.M.E. meeting

THE 1957 PACIFIC SOUTHWEST MINERAL INDUSTRIES Conference, a regional meeting of the American Institute of Mining, Metallurgical and Petroleum Engineers, drew an overwhelming crowd to Reno, Nev. Almost 500 people, three times as many as were expected, registered for the April 5 and 6 event. The conference was sponsored by the Nevada section of the A.I.M.M.E. and the San Francisco and Southern California sections were co-sponsors.

Concurrent meetings in the Reno Masonic Building discussed geology, industrial minerals and metallurgy. A luncheon at the Mapes Hotel and a cocktail hour and dinner at the Riverside Hotel provided entertainment and a chance for participants to meet each other.

Several papers of interest to the industrial mineral producer and engineer were delivered at the session on metallurgy. Kellogg Krebs, Equipment Engineers, Inc., and F. A. Lawrence, Kennecott Copper Co., were co-chairmen.

Operation of the liquid cyclones at the San Andreas portland cement plant of Calaveras Cement Co. was discussed by James T. Curry. The paper detailed the performance of four D-20-B Krebs liquid cyclones and four BC frame Hydroseal pumps rated to handle the raw feed tonnage of 220 tph. A study of the data presented by Mr. Curry indicates substantial savings in capital investment, in floor space and in horsepower and water required. His paper appears elsewhere in this issue.

Irvin S. Thyle of the Western Machinery Co. delivered a paper that he and Don W. Jenkinson prepared on heavy media separators. There are currently eight such plants in the country for the gravel industry and one is being designed for the Ventura, Calif., area. The speaker illustrated his talk with slides and outlined some of the tests currently being applied to gravel. In one instance, he said, use of heavy media separators had increased the durability of concrete 89 percent. Mr. Thyle said the operating cost for a heavy media separator plant in the 65 to 100 tph. range was 16 cents per ton, with the beneficiated material earning a premium of about 40 cents per ton. While float or rejected material in a gravel heavy media separator operation runs from 11 to 22 percent, this material is finding an increased use for secondary roads, crusher-run base material and driveways. Mr. Thyle pointed out that use of the separator gravel often made it possible to reduce portland cement requirements, citing one case of a saving of over a dollar per yard and another where one sack less per yard was used to get equivalent strengths.

Donald N. Rosenblatt of the Eimco Corporation, Salt Lake City, Utah, spoke on the use of steel casting in the mining industry. Martensitic low alloy cast steels have been developed, he said, which, when properly heat-treated, are exceptionally well suited in resisting abrasive wear and fatigue encountered in mining applications.

The production of calcined magnesite at Basic, Incorporated, Gabbs, Nevada, was the theme of a paper prepared by Raymond Sutton and Fred Menzl of the company's staff. Furnace feed at the plant consists of tertiary crushed magnesite which produces a calcined magnesite product with two percent ignition loss, as compared to a product with 10 percent ignition loss previously produced. The calcined magnesite produced by Basic, Incorporated, has an activity, as specified by the customer, which is measured and controlled by the furnace operator by temperature adjustment. Furnace product is sold both as discharged from the 14-hearth Herreshoff furnace and ground to about 98 percent minus 200 mesh.

A paper on occurrence and mining of crystalline magnesite at Gabbs for the same company was given by Conrad Martin.

Robert Kendall, Pacific Coast Borax Co., described the new open pit mine at Boron, California, in the Mojave desert. While formerly the borax minerals were mined from a room-and-pillar underground mine, now the firm uses an open pit operation with strippings running from 200 to 400 ft. thick. Ore bodies are thick enough and of sufficient economic value to make the operation successful. Stripping is done by contract and the debris is hauled to disposal areas.

Other papers presented of interest to the rock products industry include:

"Portable vacuum circulation exploration drilling" by R. Burton Rose, Allied Geophysics, San Jose, Calif.

"Nevada gypsum and its economic future" by J. F. Havard and Glen C. Taylor, Fiberboard Paper Products Company, Southgate, Calif.

"Commercial aspects of Nevada barite" by Enoch A. Brown, Magnet Cove Barium Corporation, Battle Mountain, Nev.

"Phosphate's role in the economy of the Pacific basin" by W. D. Smiley and A. K. Schellinger.

"The planning behind the plans for metallurgical and industrial plants" by Philip J. Baukol, consultant, Berkeley, Calif.

"Mineral resources of the Ione formation, California" by George B. Cleveland, California State Division of Mines.

"Blast hole methods at the Pine Creek Mine of Union Carbide Nuclear Co." by Donald Markl, Union Carbide Nuclear Co., Bishop, Calif.

Bus trips to points of interest in Nevada were scheduled on Saturday, following the meeting. A highlight to many of the visitors was the copper leaching plant near Yerrington, Nev.

END

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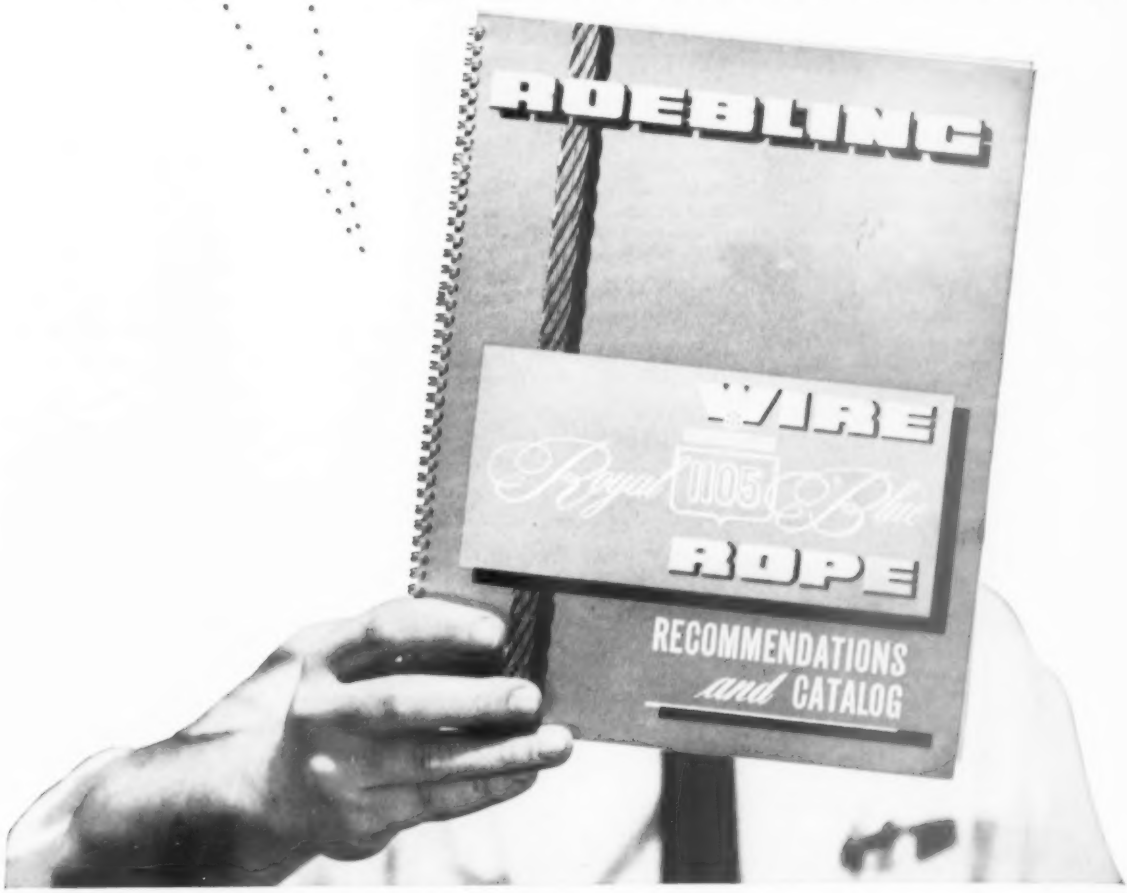

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ROCKY'S NOTES

(Continued from page 186)

The editor of the *Kansas City Times* paid tribute to John Prince in an editorial headed "John Prince, Builder," one paragraph of which reads as follows:

"Often a person's civic performance seems essentially unrelated to his everyday business activities. This was not the case with Mr. Prince. Professionally for half a century he was associated with the physical building of Kansas City. And for almost as long he placed the same engineering gifts at the disposal of causes looking to community betterment."

Vince Ahearn has paid tribute to John Prince as a pioneer president of the National Sand and Gravel Association and for his undiminished interest and helpfulness throughout his life. As a matter of fact it was John Prince who set the Association up in its present form and made Vince the executive secretary.

We would like to pay tribute to John Prince as a man who lived the kind of good life all Christian gentlemen are expected to live but so seldom do.

END

BALL MILL EFFICIENCY

(Continued from page 162)

Assume that we are dealing with a sector. M is the center and $d\beta$ the angle (very narrow). L' L'' N' N'' are the points of intersection of the sector with the compact area see Fig. 5 on page 162.

The forces exerted on the crushing bodies included in this narrow sector will be acting approximately in the direction of the axis of the sector (MN).

If δ is the apparent density of the compact mass of crushing bodies, ρ the distance between any given point of this sector and the center M,

the mass of bodies in the sector situated between distance ρ and distance $\rho + d\rho$ will be

$$d^2m = \rho d\beta \; d\rho \; \delta \qquad (8)$$

per unit of length, in the direction of the axis of the mill.

The force exerted on this element of mass will then be, [according to (7)]:

$$d^2f = d^2m \; \omega^2\rho = \omega^2\rho^2 d\beta \; d\rho \; \delta \qquad (9)$$

if $\rho_2 = MN$, $\rho_1 = ML$

By integrating (9) between these two limits, we obtain

$$df = \frac{\omega^2 \delta \, d\beta}{3} (\rho_2^3 - \rho_1^3) \qquad (10)$$

A sector of this kind may be considered alone, since we may assume that all the forces exerted in that sector are simply added to one another, without reaction on adjacent sectors.

We will cut angle AMB graphically into two angles (Fig. 6) each measuring seven degrees. We now bisect each of these angles, and mark points M_1, M_2 and points L_1, L_2 where the bisectrix intersects the limits of the compact area.

Next, still with M a starting point, we draw other congruent angles, to divide angle BMC = 18 deg. and then angle CMD = 13 deg. We will call the intersection points so obtained M_3, M_4, M_5 and M_6 and L_3, L_4, L_5 and L_6.

By applying (10), we find that the action exerted by the charge of the first sector at M, is:

(Continued on page 192)

BALL MILL EFFICIENCY

(Continued from page 190)

$$F = \frac{\omega^2 \delta \beta}{g} (\overline{MM_1}^2 - \overline{ML_1}^2) \quad (11)$$

where

ω must be expressed in radians per second
δ in grams per cubic cm.
β in radians

and linear measurements in centimeters.

F is then expressed in dynes

But if it is desired to calculate F in kilograms:

ω will be expressed in rpm.
δ in grams per cm.^{3} (or kg. per cubic decimeter)
β in degrees

and linear measurements in centimeters

and the expression then becomes:

$$F = K \frac{\omega^2 \delta \beta}{3} (\overline{MM_1}^2 - \overline{ML_1}^2) \quad (12)$$

where

$$K = \frac{\frac{(2\pi)^2}{60 \quad x \quad 2\pi}}{981.10^2 \quad x \quad 360} = 1.95 \times 10^{-10}$$

The calculation of each of the six sectors under consideration is then easy.

If we assume

$\omega = 19$ rpm.
$\delta = 5$ g./cm.^{3}
ϕ of the mill $= 3.00$ cm.

The load coefficient, in the case in point, is approximately 0.30:

$F_1 = 8.280$ kg.
$F_2 = 18.200$ kg.
$F_3 = 15.630$ kg.
$F_4 = 14.380$ kg.
$F_5 = 14.590$ kg.
$F_6 = 16.180$ kg.

each of these figures representing the effort per centimeter of length of the mill.

The problem can also be solved graphically as follows: At each of the points M_1 M_2 . . . M_6 we draw a vector proportional to the force F_1 F_2 . . . F_6 exerted at that point (Fig. 6). At each of the points M_1 M_2 . . . M_6 we now resolve the force applied at that point into its normal and tangential components.

N_1 N_2 . . . N_6 are the normal components and T_1 T_2 . . . T_6 are the tangential components.

(Continued on page 196)

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NEW U.S. PATENTS

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Cement

2,787,374—A continuous centrifugal wet classifier for the sharp classification of finely divided materials suspended in a fluid. It is particularly useful in the wet process manufacture of **portland cement,** where the slurry to be treated comes directly from a ball mill or the like. (to K. Krebs. Assigned to Centriclone Corp.)

(NOTE: See also No. 2,788,961, under **Lime.**)

Aggregates

2,786,531—Methods of using permeable concretes in cementing of oil wells. The concrete is made from an hydraulic cement, a pozzolan, water and a lightweight aggregate. Preferred for use as the pozzolan is calcined, ground, oil-impregnated **diatomaceous earth.** The same material in larger particle size is preferred as the aggregate. Other suitable aggregates include sintered or **expanded clay** or **shale,** expanded **perlite,** exfoliated **vermiculite, pumice, pumicite, volcanic cinder, volcanic scoria** and expanded **blast-furnace slag.** (to G. B. Mangold, J. A. Dyer and J. T. Hart. Assigned to Petroleum Engineering Associates.)

2,786,772—In a method for making cellular **expanded clay** aggregate suitable for use in lightweight concretes, a mixture of the required raw materials is pelletized and then expanded by firing in a rotary or shaker hearth furnace to a temperature of 2,300 to 2,450 deg. F. for a period of 3 to 6 min. and immediately cooled. To prevent agglomeration of the pellets, provision is made for them to rest on a moving bed of sand during bloating. The finished particle contains numerous nonconnected air cells, giving it light weight, while the glassy surface makes it impervious to moisture. (to J. H. Stewart and F. W. Wack. Assigned to Stark Ceramics, Inc.)

2,788,895 — An apparatus for removing hard mud and clay balls from river **gravel.** The wet raw material is fed continuously to an inclined, rotating endless belt studded with a large number of upstanding spikes on its outer surface. Mud and clay balls are impaled, while the gravel drops off into a bin. Provision is made for cleaning the mud and clay from the spikes by raking or washing at some stage of the belt's travel. If one pass through the device fails to accomplish necessary cleaning, the gravel is sent over the belt again. (to P. Spence.)

Gypsum

2,788,960 — An improved method and apparatus for the continuous calcination of **gypsum** wherein neither the raw rock nor the end product, stucco or plaster, is in contact with the products of combustion of the heating medium. The rock, crushed to 85 percent through 100 mesh, is moved by intermeshed screw conveyors through one or a series of cylindrical or trough-like indirectly heated calciners. Close temperature control can be maintained to produce a uniform final product containing little if any over-burned gypsum (anhydrite) or under-burned gypsum (dihydrate). (to S. D. Skinner and L. H. Seufert. Assigned to National Gypsum Co.)

Mineral Wool

2,789,319—An apparatus for opening and cleaning masses of relatively short, weak, brittle fibers, for example **mineral wool.** (to I. Barnett. Assigned to Johns-Manville Corp.)

2,789,694—As a means of effectively removing pellets from **mineral wool,** a depelletizing chamber is provided with a flow of air strong enough to handle the wool. During the air circulation the wool impinges against the walls and a sloping screen, and the pellets are shaken free and removed. Harmful excessive agitation of the wool is avoided. (to L. H. Hills. Assigned to The Garlock Packing Co.)

Lime

2,788,961 — A vertical shaft kiln adaptable to the production of **hydraulic cement** clinker or **lime,** and for other sintering applications. The kiln has a relatively large upper section and small lower section. In the upper portion of the kiln, the feed is deflected around a centrally-positioned combustion chamber and fuel burner, so that burning occurs at virtually equal intensity over the entire cross-section of the kiln. The material is more uniformly burned than in kilns where it is in contact with the heating gas. Another advantage is elimination of the usual excessive deterioration of fire brick around the gas inlets, which frequently necessitates premature shutdowns for repair. (to H. Pooley and L. D. Parker. Assigned to Vickers-Armstrongs Limited.)

(NOTE: See also No. 2,787,345, under **Miscellaneous.**)

Miscellaneous

2,787,345—Method of making fire resistant structural units having a core of xonotlite, or synthetic **wollastonite,** which is made from a slurry of **lime** and **silica. Asbestos** fiber can be added to the lime-silica slurry to produce a stronger product. (to L. D. Soubier and E. C. Shuman. Assigned to Owens-Illinois Glass Co.)

2,788,257—In a process for recovering sylvite from **sylvinite** ore, the ore is crushed and dissolved in hot unsaturated brine. The slurry is filtered to remove slime and undissolved halite. The clear brine is then cooled, causing sylvite crystals to be precipitated. (to J. B. Duke. Assigned to Minerals & Chemicals Corporation of America.)

2,789,772—A process and portable apparatus to be used in **kaolin** mines for rapidly disintegrating the kaolin and forming a low-water slip of such fluidity that it can be transmitted by pipeline for long distances without settling. The mechanism is a counter-flow disintegrator wherein the disintegrating knives are arranged to provide a shaving or paring action. Use of this apparatus can eliminate some of the costly steps often used in the processing of kaolin. (to J. T. Williamson. Assigned to Thiele Kaolin Co.)

END

Morrow & Reesman Co., Kansasville, Wis., operates its Cedarapids Portable Crusher and Screener with a P&H Diesel Power Plant. This heavy-duty crusher produces 1½" gravel used for road base material.

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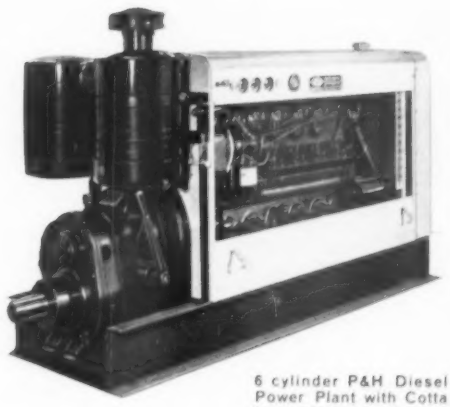

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BALL MILL EFFICIENCY

(Continued from page 192)

If θ is the friction coefficient of the charge of crushing bodies in relation to the lining, it may be said that, to ensure that the charge will not slip, we must have

$$\theta \quad (N_1+N_2 \ldots N_n) > T_1+T_2+T_3 \ldots +T_n$$

where all the N's are of the same sign, where T_n is negative.

In the case in point:

$$\theta > \frac{7.55+14.10+9.01+5.66+3.68-0.60}{3.47+11.97+12.60+13.23+14.07+16.10}$$

i.e. $$\theta > \frac{39.40}{71.44} = .55$$

In a dynamic machine, such as a mill, a wide safety margin must, of course, be provided, and to eliminate all sliding, in practice we should have

$$\theta > .70$$

With a smooth lining the friction coefficient between the mass of crushing bodies and the lining varies but is always lower than the value mentioned above. Thus, the charge could not be driven by a smooth lining without sliding.

In cases where the adherence coefficient approximates the required value, sliding will usually be an oscillating movement because the friction coefficient will alternate between the values corresponding to a relative movement and to the absence of any relative movement. The load will move in surges, reducing the efficiency of the mill.

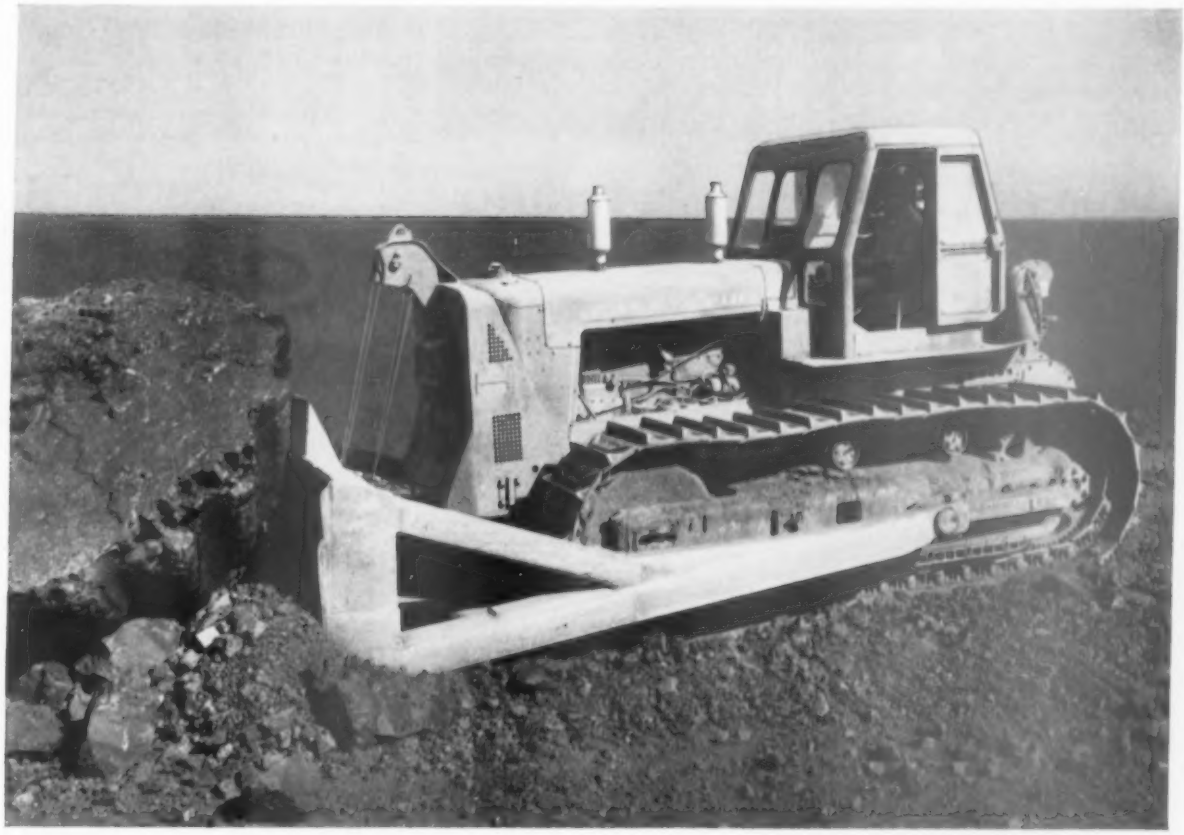
The loss of energy resulting from a sliding movement, whether or not oscillating, can be assessed as follows: If n is the rotation speed of the mill, expressed in revolutions per minute and n′ is the average true speed of the charge (which rotates slower due to sliding), expressed in revolutions per minute, then the ratio $\frac{n'}{n}$ is the ratio between the speed of a ball in the compact mass which hugs the lining and the speed of the lining itself.

The energy passing from the lining to the charge is equal to the algebraic sum of the tangential forces (in the case in point $T_1+T_2 \quad +T_n = 39.4$ kg. per unit of length of the mill, i.e. for 1 cm.) multiplied by the peripheral speed of the lining.

The power communicated to the charge will be equal to the product of this sum divided into the true speed of the peripheral crushing bodies.

This means that if $\frac{n'}{n} = .80$, 20 per-

(Continued on page 198)



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TRIPLED TRACTOR-SHOE LIFE

It's "tough-going" in a slag pit! Heavy loads, the grinding impact of abrasive rock and metal, really put tractor shoes to the test. And that's exactly what this steel producer did.

Amsco® cast Manganese Steel Tractor Shoes were installed in place of rolled shoes. The result: *a 3-time increase in service life.* While rolled shoes had previously been replaced after one season's service, the Amsco pads lasted nearly *3½ years—a total of 3374 service hours.*

Here's further proof that Amsco Manganese Steel—"the toughest steel known"—can save you money and replacement time wherever severe impact and abrasion are a problem. Call your nearest Amsco representative, or write us direct, for further information on Amsco Tractor Shoes.

Amsco Manganese Steel Tractor Shoes
In addition to excellent impact and abrasion resistance, Amsco Tractor Shoes have countersunk bolts. This means less wear on bolts, often saves bolt-replacement when changing pads.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

Enter 1334 on Reader Card

BALL MILL EFFICIENCY

(Continued from page 196)

cent of the energy has been lost due to friction between lining and charge.

It is still theoretically possible to find the true "rotation" speed of the charge when the friction factor is too small. To find it, we would need to recalculate the θ required in the case of peripheral speeds, which would be slower than the true speed. For each case we would have to take other Davis curves, recalculate other values of F_1 F_2 ... F_6, etc.

When the speed decreases, normally the required θ's also decrease. When, for a given speed n′, the required θ does not exceed the true θ, rotation speed of the ball will ensure that the balls adhere to a lining rotating at that same speed.

The difference between speeds n and n′ expresses the loss of energy which was calculated above. The mass of balls will only rise before dislocation to a height corresponding to speed n′ and quite apart from any loss of power, will create a crushing pattern different from the expected pattern. This is mentioned to illustrate the type of deductions which may be drawn from our method of analysis.

Any analysis of a given mill also applies to mills of a different diameter, provided the rotation speeds are in inverse ratio to the square roots of the diameters of the mill.

We are considering the coefficient relating to the friction of a mass of crushing bodies on the lining, after addition of the material to be crushed. Similarly, referring to Uggla's curves, the coefficient μ between crushing bodies must be taken after addition of the material which is to be crushed.

In the second part of this article we will attempt to find the most logical solution to the problem of selecting the inner profile of the lining of a ball-mill.

END

NSGA Opposes Bill

THE NATIONAL SAND AND GRAVEL Association has advised the Senate Judiciary Committee that it is opposed to Senate bill S. 11, which in its opinion prejudices the right of a manufacturer or producer to meet in good faith the lower delivered price of a competitor. The association presented its views on the bill, which would amend the Robinson-Patman Act, at hearings before a Senate Judiciary subcommittee. The main objection to the amendment is that it is so vague it will cause more confusion than it eliminates.

RAYMOND VERTICAL MILL

SINGLE VERTICAL ROTOR SHAFT CARRIES FAN BLADES, SWING HAMMERS AND REVOLVING WHIZZERS

SIMPLE DESIGN: NO GIMMICKS, NO COMPLICATED ADJUSTMENTS, AND NO CLOSE CLEARANCES.

HINGED DOORS OPEN FULL WIDTH FOR COMPLETE ACCESS TO THE GRINDING CHAMBER

PRECISION CONSTRUCTION

WHIZZER SEPARATION

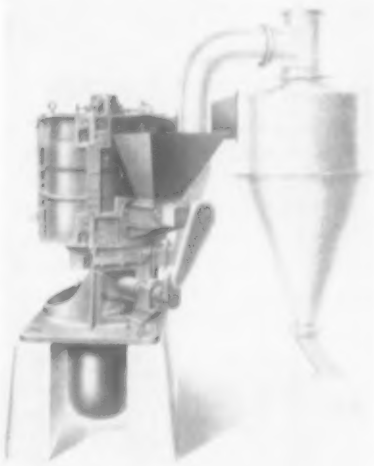
Wide Open Accessibility for Easy Inspection and Cleaning

Superfine Pulverizing with a Simplified Grinding Unit

This modern Raymond Vertical Mill is a straightforward commonsense design that combines top performance with easy control, and provides quick accessibility that reduces down-time to a minimum in making new set-ups or adjustments. By loosening a couple of star nuts, the doors can be swung open to expose the complete interior with all the working parts in a matter of seconds.

This specialized unit excels in the grinding of non-abrasive materials to extremely high finenesses ranging from minus 325 mesh into the subsieve sizes. On some of these softer materials, finished products in the range of 95% to 98% finer than 5 to 10 microns are commonly produced on this mill. It is likewise very effective in pulverizing tough, hard-to-reduce and fibrous products where close fineness control is required.

Write for Bulletin No. 78, which describes two sizes: the 18" and 35" Vertical Mills.



Exterior View of the 35" Raymond Vertical Mill. Interior shown at top.

COMBUSTION ENGINEERING, INC.

Raymond Division

1307 North Branch St.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

Enter 1286 on Reader Card

NEW MACHINERY

Portable Sand Classifier and Washer

MECKUM ENGINEERING, INC., Dayton Road, Ottawa, Ill., has introduced the Meckum Portable Sand Master. The 72-in. model of the sand classifier and washer is pictured. Coupling to the semi-tractor for ease of movement over highways, the unit incorporates a rugged structural steel frame which acts as a trailer, and a heavy rear axle.

Enter 200 on Reader Card

Hollow Stem Auger Acts As Own Casing

MOBILE DRILLING, INC., Dept. 18, 960 N. Pennsylvania St., Indianapolis, Ind., announces the MDX 9026 hollow stem auger. Available in diameters from 7 to 10 in., and in lengths from 2 to 10 ft., the new auger acts as its own casing. As shown in Fig. 1, plug A closes the hollow stem until desired depth has been reached. The plug is then removed and sampling tool B is inserted and driven through area C to secure sample. The entire operation is performed without removing auger from the hole. Coring may be continued through hollow stem of the auger after rock has been reached.

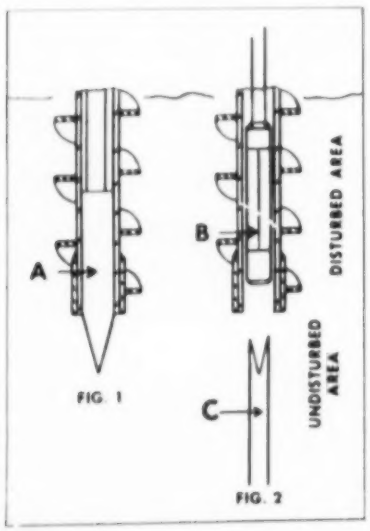


FIG. 1

FIG. 2

Enter 201 on Reader Card

Blocks and Sheaves

SAUERMAN BROS., INC., 630 S. 28th Ave., Bellwood, Ill., announces that Durolite wire rope blocks and sheaves are now available as separate items. The blocks are used on Sauerman high-speed Cableways and DragScraper machines. Durolite sheaves are available in stock from 6 to 18-in. (alloy steel), 20 to 24-in. (cast steel).

Durolite blocks feature end thrust bearings to prevent side frame wear, free-moving swivels for ease in positioning and a cast bead on the side frames to prevent fouling of the wire rope. Sizes extend from 6- to 18-in. with bronze bearings and from 8- to 42-in. in roller bearings. Sizes up to 54-in. can be furnished.

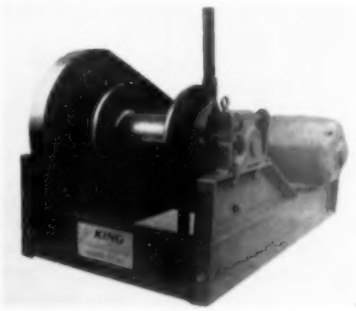
Enter 202 on Reader Card

Mine Ventilation Tubing

BEMIS BRO. BAG CO., 408 Pine St., St. Louis 2, Mo., announces that it is producing Nyprene Flexipipe in bright "safety yellow." The flexible mine ventilation tubing in the new color is said to be more distinctly visible in dim mine tunnels, reducing the danger of tubing puncture by machinery and equipment.

Enter 203 on Reader Card

Winch Type Car Puller

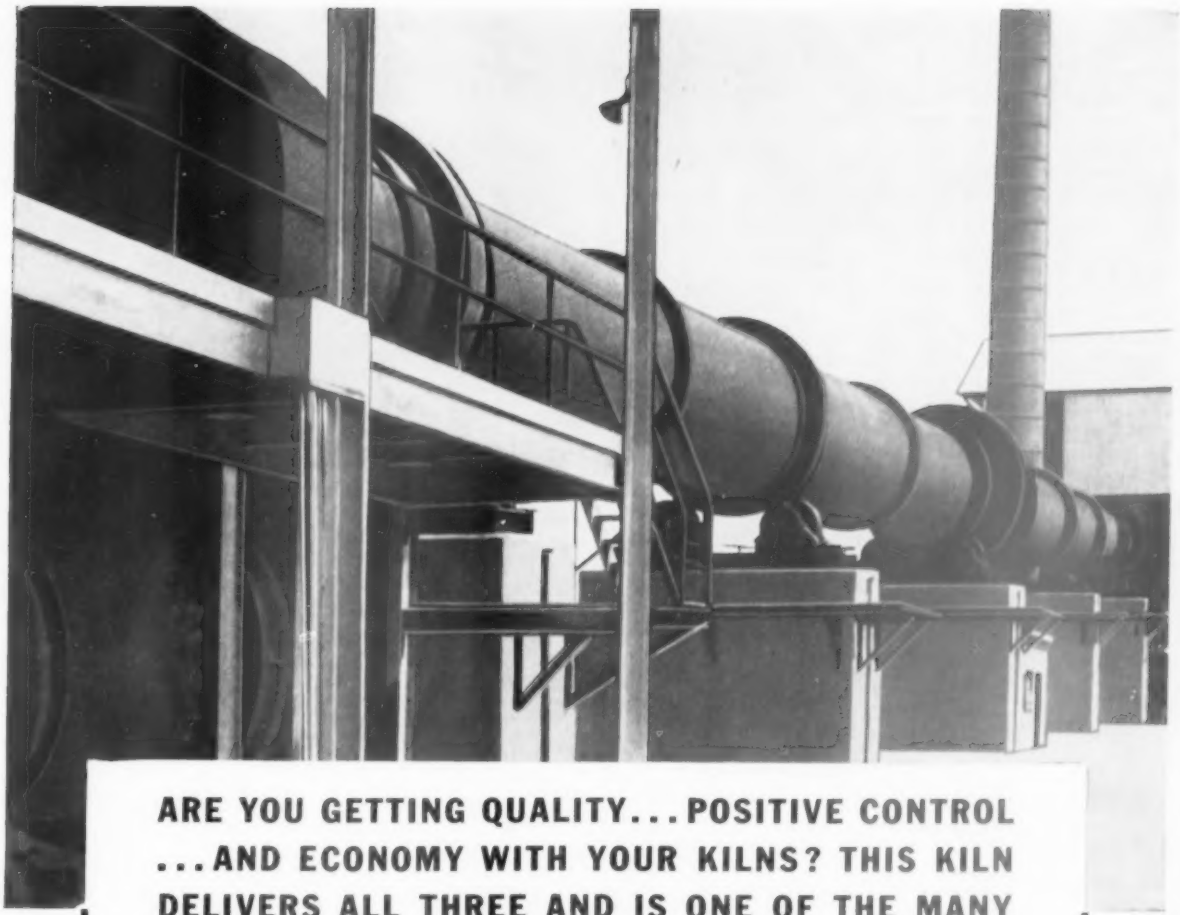


KING MANUFACTURING CORP., 3146 W. Chicago Ave., Chicago 22, Ill., has introduced an electric-powered winch type car puller. The unit has a free wheeling or free spooling cable drum which is said to provide for fast pay out of cable when a car is to be pulled to location or when a barge is to be spotted. Power is applied to the drum through a jaw clutch.

The winch has a pulling speed of 30 fpm. and is equipped with a 5-hp. motor and gear reduction unit. The manufacturer says it can handle one loaded freight car on straight and level track.

Enter 204 on Reader Card

(Continued on page 203)



ARE YOU GETTING QUALITY...POSITIVE CONTROL ...AND ECONOMY WITH YOUR KILNS? THIS KILN DELIVERS ALL THREE AND IS ONE OF THE MANY TYPES MANUFACTURED BY VULCAN

This one, 9'x300', is capable of delivering 225 tons of quick lime per day, and is operating efficiently for the United Cement Co. of Montevallo, Alabama.

This newest of kilns is mounted on VULCAN's latest type supporting rollers, all of which are automatically lubricated and easily adjusted to compensate for wear or moderate misalignment. It is driven by a 75 HP variable speed motor with a standby diesel-electric generator, in case of power failure.

This latest type Lime Kiln has a 60" disk feeder which is electrically synchronized with the rotating speed of the Kiln, which insures an even flow of raw material essential to quality control and economy. With the most modern gas flow and temperature reading instruments, positive control is constantly maintained over the burning operations.

VULCAN IRON WORKS designs, engineers and manufactures Kilns for: (1) Cement (wet or dry), (2) Dead Burning Dolomite, (3) Calcined Coke, (4) Lime, (5) nodulizing and agglomerating, (6) pigments. THE VULCAN IRON WORKS with its 107 years of continuous business means experience and know-how. Write today... Estimates, constructive suggestions and preliminary drawings will be furnished (as far as possible) without obligation.

Any information on items listed below will be sent to you immediately:

- Rotary Kilns, Coolers and Dryers
- Rotary Retorts, Calciners, Etc.
- Improved Vertical Lime Kilns
- Automatic Quick-Lime Hydrators
- Briquetting Equipment
- Cast-Steel Sheaves and Gears
- Steel Plate Fabrications

VULCAN IRON WORKS

WILKES-BARRE, PA., U.S.A. CABLE ADDRESS "VULWORKS WILKESBARRE" ESTABLISHED 1849

Enter 1393 on Reader Card

NEW MACHINERY

(Continued from page 200)

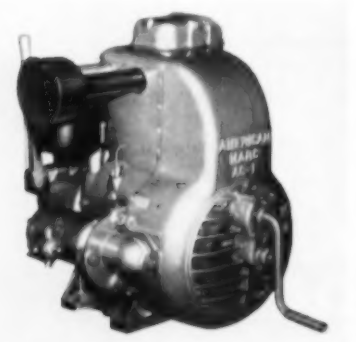
Crawler-Mounted Excavator

KOEHRING DIVISION, Koehring Co., 3026 W. Concordia, Milwaukee 16, Wis., announces the newest addition to the Koehring line of excavators, the crawler-mounted 805. The machine can be used as a crane, 2 to 3-cu. yd. dragline, up to a 3½-cu. yd. clamshell or a 2-cu. yd. shovel. Equipment includes friction type steering brakes; main clutches with mechanical power booster; cam action and automatic adjustment for heat expansion and a high A-frame which is power raised or lowered. Six turntable and six hook rollers are said to assure operating stability and evenly distribute the unit's weight.

Enter 214 on Reader Card

Air-Cooled Diesel

AMERICAN MARC INC., 1601 W. Florence Ave., Box 549, Inglewood, Calif., having purchased plant and facilities of Hallett Mfg. Co., announces its first innovation in the Hallet line of diesel engines: Model AC-1. Redesigned before its introduction, the AC-1 shows an increase in bhp. from 5.5 to 6.5, resulting from the incorporation of a new camshaft and blower housing. The air-cooled diesel achieves 1,800 rpm. and is adaptable for many basic power applications.



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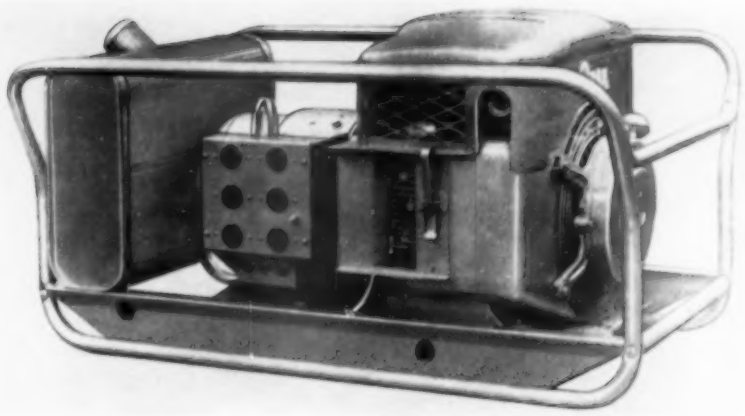


Portable Electric Plant Generates 5,000 Watts

D. W. ONAN & SONS INC., 2515 University Ave. S.W., Minneapolis, Minn., produces a lightweight portable 5,000-watt dc. electric generating plant. The unit will provide power to operate lights, electric tools and universal motors. Prime mover for the plant is the Onan two-cylinder opposed, four-cycle, air-cooled gasoline engine. Model CCK, rated at 12.9 hp.

The Onan all-climate generator is direct connected to the engine for positive permanent alignment. Of drip-proof design, it is rated at 5,000 watts, 115 volts dc. The unit weighs 315 lb.

Enter 219 on Reader Card

"Down-the-Hole" Drill Bits

CHICAGO BRUNNER & LAY BIT CORP., 9300 King St., Franklin Park, Ill., has added 6 and 6½-in. Hole-Master bits to its line of percussion rock drill bits. The new bits, designed for use with "down-the-hole" type drills, have splined bodies of super-tough steel, as well as fast-drilling carbide inserts for resistance to wear and shock, according to the manufacturer.

Enter 216 on Reader Card

Truck Mounted Crane

TRUCK CRANE, INC., subsidiary of Anthony Co., 1750 Baker St., Streator, Ill., announces the availability of Truck-Crane units. Model E-5-G with top-mounted winch is illustrated.

"The crane that is built into the truck" permits loading, hauling and unloading with one unit. It requires 18 in. of space behind the truck or tractor cab, leaving the body free for payload. Power is hydraulic in all phases of operation with a PTO-driven pump. Boom swing is 280 deg., and it projects or retracts in horizontal position or at any point up to an 85-deg. elevation. Capacity is 5,000 lb.

Enter 217 on Reader Card

Steel Dump Body

DAYBROOK HYDRAULIC DIVISION, L. A. Young Spring & Wire Corp., Bowling Green, Ohio, has brought out Model 1048 all-welded steel dump body. Safety features of the model are sloping side braces, running boards, tailgate horizontal bracing and bottom structural channel, preventing accumulation of dirt or stone on them during loading of the body. Model 1048 can be equipped with an 88C Daybrook Speedlift hoist.

Enter 218 on Reader Card

(Continued on page 204)

Enter 1250 on Reader Card

Yes!...it's ALL STEEL

HP RANGE:
½ to 40 hp

RATIOS:
4:1—14:1—24:1 (or 20:1)

OUTPUT SPEED RANGE:
420 to 5 rpm

TORQUE RATINGS:
up to 31,000 lb-in

FALK
ALL STEEL
Shaft Mounted Drive

...Steel can "take it"!

STEEL frame ...of fabricated plate supports all rotating elements—provides double the ability of iron to maintain vital alignment of revolving elements, even under shock load or external impact.

STEEL housing...will not fracture, serves only as protective cover and lubricant reservoir. Therefore, lubricant supply is safeguarded.

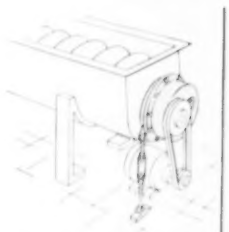
STEEL tie-rod and straddle-mounted tie rod brackets...are fastened to heavy steel frame by steel bolts in double shear.

DELIVERIES TO MEET YOUR REQUIREMENTS

Off-the-shelf delivery from your Authorized Falk Distributor. *Shipment from factory or warehouse stocks* within 72 hours after receipt of your order.

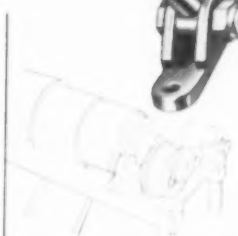
Write for Bulletin 7100

A FEW TYPICAL APPLICATIONS



SCREW CONVEYOR

BUCKET ELEVATOR



GRAVEL CLASSIFIER

BELT CONVEYOR

APRON FEEDER

LINE SHAFTING

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 1, WIS.

Representatives and Distributors in Most Principal Cities

Manufacturers of Quality Gear Drives and Flexible Shaft Couplings

FALK

...a good name in industry

NEW MACHINERY

(Continued from page 202)

Screw Conveyor

FORT WORTH STEEL & MACHINERY CO., 3504 Jackson St., Forth Worth, Texas, announces the "Fort Worth Beeline" screw conveyor. Precision components are said to result in economical installation and automatic straightness. Beeline screw conveyor components and accessories are made to industry standards and are said to be interchangeable with equipment of other makes. Offered in diameters from 4 through 16 in., the conveyor is recommended for a variety of applications in conveying free-flowing bulk materials.

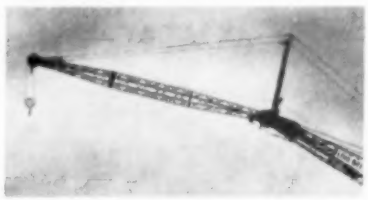
Enter 220 on Reader Card

Car Shaker

EASTERN CONSTRUCTORS, INC., Poland, Ohio, announces a car shaker designed to expedite unloading of material from hopper bottom, open top railroad cars. The action of the car shaker is produced by rotating an unbalanced shaft at 1,800 rpm. The shaft is fitted in two heavy-duty self-aligning bearings carried in bearing housings which fit snugly in two heavy side plates. The side plates rest on the upper edge of the car when the shaker is in its operating position. The eccentric action of the rotating shaft is carried directly to the car without going through any welded connections. Power for driving the shaft is provided by a 10 hp. totally enclosed motor.

Enter 221 on Reader Card

High-Capacity Jibs



LINK-BELT SPEEDER CORP., Cedar Rapids, Iowa, has introduced three new high-capacity jibs in 20, 30 and 40-ft. lengths. Having 6, 5 and 4-ton maximum capacities respectively, the jibs are made for use on the Link-Belt Speeder 88, 98 and 108 Series crawler and rubber-tired shovel-cranes. They are said to double the capacity of previous Link-Belt Speeder jibs because of the extra strength of the lightweight alloy steel sections from which they are made.

The jib boom is a two-piece, 20-ft., all-welded box lattice unit that can be extended to 30 or 40 ft. by the addition of one or two 10-ft. extensions. A 10-ft. jib strut is furnished for all jobs regardless of length. Turnbuckles mounted at the base of the boom and at the peak of the jib may be adjusted for equalization of the guy lines, obtaining a variety of jib angles.

Enter 222 on Reader Card

Crane Shovel Attachment

THE QUICK-WAY TRUCK SHOVEL CO., P. O. Box 1800, Denver, Colo., is announcing its new "Chore-Master," a hydraulic reaching, grading, digging attachment for crane shovels. The Chore-Master is a telescoping boom having a radius of 21 to 33 ft. which mounts on a special gantry and is interchangeable with other standard attachments on Quick-Way cranes. The telescoping action is operated by a hydraulic cylinder. A second hydraulic ram opens and closes the bucket with a wrist action. A hydraulic motor rotates the bucket 50 deg. in either direction on the end of the boom.

The hydraulic system includes a tank and a tandem pump which operates off the crane engine.

Enter 223 on Reader Card

Tractor Attachment

THE FRANK G. HOUGH CO., 705 Seventh St., Libertyville, Ill., subsidiary of International Harvester Co., announces that its line of four-wheel-drive Payloader tractor-shovels—Models HU, HH and HO—will offer Drott 4-in-1 buckets as optional equipment. Formerly the attachment was available only on International-Harvester crawler models. In the rubber-tired front-end loader field, it will be exclusive with Payloaders. The 4-in-1 bucket can be used as a shovel, clamshell, scraper or bulldozer.

Enter 224 on Reader Card

Portable Sump Pump

SCHRAMM, Inc., 900 E. Virginia Ave., West Chester, Pa., has introduced a self-contained portable sump pump, 19⅜ in. high, which can pass through a 9 x 11-in. opening. Pump speeds vary between 3,200 and 3,600 rpm., depending upon the head against which it is pumping and the supplied air pressure. The pump body, impeller and strainer are made of bronze to resist corrosion and to insure spark-free operation. Heavy-duty thrust and radial bearings support the two-part impeller, mounted on a stainless steel shaft. Bearings are double sealed.

Enter 225 on Reader Card

(Continued on page 206)

⅓ MORE PRODUCTION . . . ⅓ LESS MAINTENANCE . . . ¼ LOWER FUEL COSTS

With MURPHY DIESEL POWER

"Our Murphy-powered crusher is averaging 1200 yds. of minus 1¼" crushed limestone per day . . . definitely higher production than we ever got before using Murphy power. We operate 9 hours a day, 5½ days a week, and this Murphy Model 22 *has been running since 1953 with minimum attention.* For continuous duty under heavy load, and for general all-around good performance and economy, Murphy Diesels just can't be beat!"

V. L. Greenwell, Partner
WATERS CONSTRUCTION CO.
Decatur, Alabama

When it comes to heavy-duty power for aggregate plants, shovels, draglines, generators, pumps, compressors, etc., Murphy Diesels are recognized throughout the construction industry for their dependability, long life, trouble-free service and economy that's unmatched by any other engine of comparable size. Why don't you put the many exclusive advantages of Murphy Diesel engines to work on your next job? Your Murphy Diesel Dealer can tell you how they'll make more money for you.

356RO

MURPHY DIESEL

Heavy-Duty Power
for Rock Crushing

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generator units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY
5315 W. Burnham St., Milwaukee 14, Wis.

Enter 1333 on Reader Card

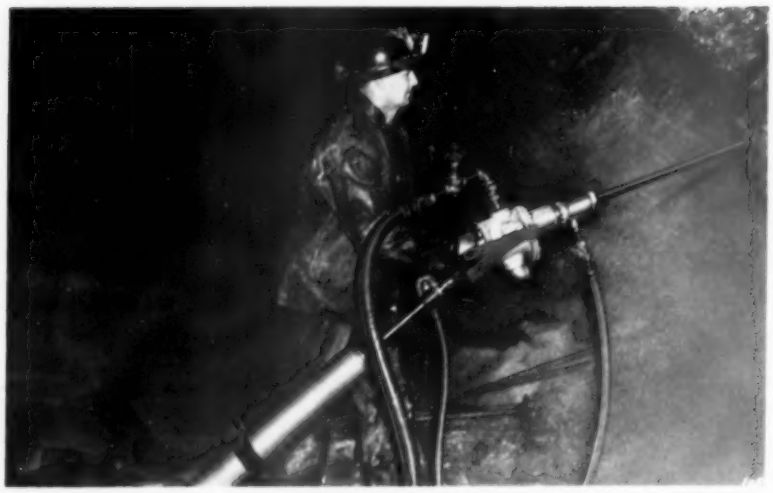
NEW MACHINERY

(Continued from page 204)

Storage Structure

CID AIR STRUCTURES CO., 1501 E. 96th St., Chicago 28, Ill., has designed an all-weather storage structure of Fiberthin, vinyl-coated nylon made by U. S. Rubber Co. Available in sizes up to 100,000 sq. ft., the air structures have swinging double doors which permit the passage of fork-lift trucks. The 40- x 80- x 20-ft. air structure illustrated was erected for Johns-Manville Corp.'s Waukegan, Ill., plant. It is used for storage of palletized bags of asbestos fiber, stacked several pallets high on a concrete floor.

Enter 226 on Reader Card



Air Leg Diamond Core Drill Is Cradle Mounted

E. J. LONGYEAR CO., Minneapolis 2, Minn., has introduced a diamond core drill that is cradle mounted on an air leg for short hole underground coring. The Hi-Speed air leg diamond drill can be operated by one man and is said to require no spraging or bracing. As drilling proceeds, the air leg advances the string of drill rods into the hole. Standard E or XRT rods are recommended for use with the drill.

The drill is powered by a 10-hp., 3,000 rpm. air motor and has rated capacity of 60 ft. of E rod. The motor is equipped with a hexagon slip chuck. A built-in water swivel-and-rod adapter has a hexagon spindle for ease in coupling when adding rod.

According to the manufacturer, the simplicity of the unit makes it adaptable for use in confined spaces.

Enter 228 on Reader Card

New Fifth Wheel Design for Front Suspension

A. O. SMITH CORP., Pacific Coast Works, 5715 Smithway, Los Angeles, Calif., is producing a new integral axle fifth wheel for front suspension on the rear trailer of a truck train. It is said to eliminate the need for leaf springs on trailer fifth wheel assemblies. It is engineered for optimum driving conditions with empty truck and trailer as well as with full loads. Reduction in weight was accomplished by integrating the assembly into the axle housing, resulting in an operating unit whose total weight is about 550 lb.

The A. O. Smith integral axle fifth wheel consists of two assemblies: the stabilizer assembly fastened to the trailer frame and the axle assembly. The latter, consisting of shock-absorbing cushion rings, is housed inside the front axle which acts in a dual capacity. The integrated assembly which features rubber doughnuts floating in a sealed oil bath is said to neutralize rebounds and reduce backlash.

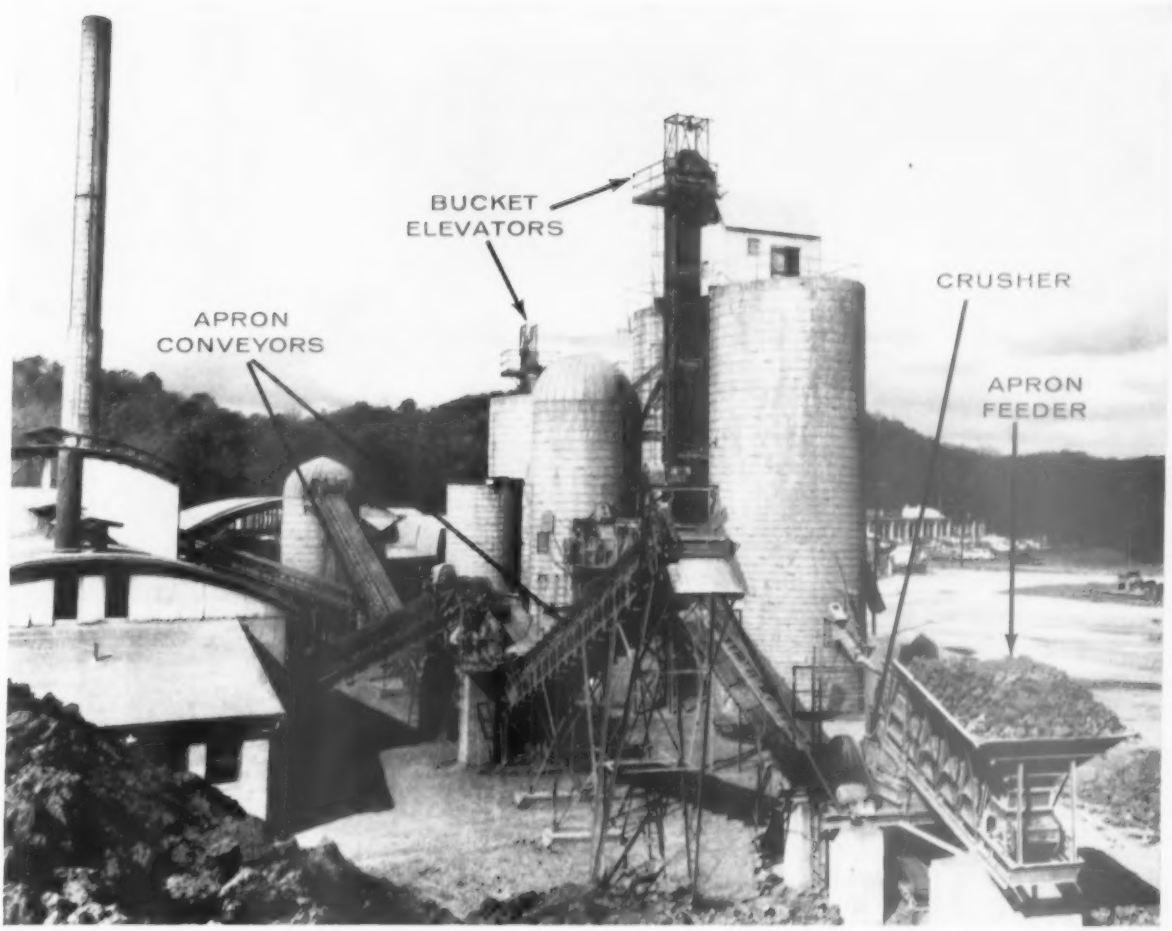
Enter 227 on Reader Card

Welders

THE LINCOLN ELECTRIC CO., 22801 St. Clair Ave., Cleveland 17, Ohio, has added 180-amp. and 250-amp. capacity Idealarc welders to its line of combination a.c. and d.c. welders. The "two-in-one" features permits operation of all types of manual electrodes, including stainless and alloy rods. The units also are available as straight a.c. machines, to which the d.c. rectifier can be added later.

The machines operate on single-phase, 230-v., a.c. input power. Power factor correction condensers and spe-

(Continued on page 208)



Still other Jeffrey equipment, not visible here, is contributing to the high efficiency of this concrete products plant.

Flexible standard units are engineered by **JEFFREY** to meet your special requirements

Whether you're modernizing an existing system or planning an entirely new plant layout, let Jeffrey engineers assist you. They'll recommend the combination of conveying and processing equipment giving you highest production at lowest possible cost. Jeffrey's long line of standard units permits almost endless combinations to meet special requirements.

For this help, and for catalogs containing complete information on Jeffrey equipment, write to The Jeffrey Manufacturing Company, Columbus 16, Ohio. Replacement parts available from Jeffrey authorized distributor stocks.

In addition to the units named, the following Jeffrey equipment is widely used in the aggregate, stone, sand and gravel, clay, phosphate and sulphur rock industries:

Scraper Conveyors • Spiral Conveyors • Pulverizers • Power Scoops • Car Pullers • Vibrating Conveyors • Magnetic Separators • Stackers • Batchers • Chains • Feeders • Grizzlies • WAYTROLS • Jigs.

CONVEYING • PROCESSING • MINING EQUIPMENT • TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

JEFFREY

Enter 1331 on Reader Card

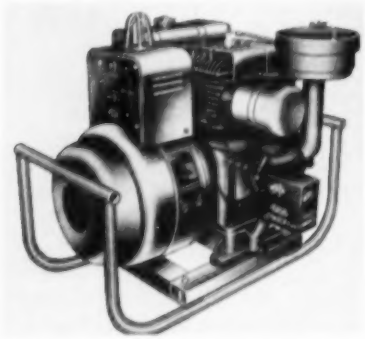
NEW MACHINERY

(Continued from page 206)

cial input voltages are available as optional features. Continuous current control is provided for the entire range of welding heat, and a direct-reading current indicator shows the current setting.

Enter 208 on Reader Card

Automatic Idling Control



WINCHARGER CORP., Sioux City, Iowa, subsidiary of Zenith Radio Corp., has introduced the Winco Automatic CONSERV-er idling control for Winco portable electric-generating plants. The electrically motivated idling control allows the generating plant to idle until a load of 75 watts or more is applied. It is available as an accessory on the 2,500-watt Winco 205B14S2D (illustrated) and on the new 3,500-watt 305B23S2D. Both units are direct-connected.

Ente. 209 on Reader Card

Recording Device

BARBER-COLMAN CO., Wheelco Instruments Div., Rockford, Ill., announces Series 8000 Wheelco electronic multipoint recorder, designed for permanent recording of up to 16 points on one chart. The recorder is a null-balance instrument. Measurements may be obtained with sensing units such as thermocouples, radiation detectors and other devices where the measured variable can be resolved into an electrical signal. Up to six limit switches may be incorporated to provide for high and/or low signal indication. Up to four switches may have common front set, additional switches are independently adjustable.

Enter 210 on Reader Card

Wagon Crane

HARNISCHFEGER CORP., Milwaukee 46, Wis., presents P & H 155WC 10-ton wagon crane, designed for high mobility in maintenance, stockpiling, loading, unloading and other industrial applications. The design incorporates two axles and short turning radius, a high cab for full circle visibility, and travel speeds in excess of 10 mph. The new model 155WC also has been engineered to travel, lift, swing or boom independently with full loads through a full 360 deg. Other P&H features, such as planetary boom hoist, scientific weight distribution and all welded steel construction have been incorporated also. A single P&H 287-18 diesel developing 67 hp. at 1700 rpm. provides power for both carrier and for the upper unit.

Enter 211 on Reader Card

Two-Way Hydraulic Loader

SEABOARD EQUIPMENT CO., 7 Hanover St., New York 5, N.Y., has announced availability of the Merton two-way loader, a diesel- powered hydraulic loading shovel. Self-powered up to 13½ mph., the unit can discharge its bucket at the front or over the rear and provides straight-line loading from stockpile to discharge point. This feature is said to afford mobility and penetration, and to reduce turning and pivoting.

Height of the discharge can be varied from ground level to 9 ft. in front and from 4 ft. 10 in. to 9 ft. at the rear. Two pairs of double-acting hydraulic rams are used to control bucket movements. The main lift ram incorporates a damping device which automatically slows down the bucket as it travels over top-dead-center, reducing the stresses on the ram packings. A ⅞-cu. yd. bucket and a 24-sec. operating cycle give the loader an output of approximately 100 cu. yd. per hour.

Enter 212 on Reader Card

Side-Dump Transport Truck Unloads from Buckets

BAUGHMAN MANUFACTURING CO., Jerseyville, Ill., has introduced a new side-dump transport which unloads from individual buckets into truck-mounted spreader bodies, large portable concrete mixers and other carriers. The buckets can be raised or lowered by means of hydraulic rams which are mounted on a monorail and moved into unloading position by means of a winch arrangement.

The buckets are available with or without lids. The latter fold out during discharge to form a chute. Controls, located on the side of the body, operate either a P.T.O. or auxiliary engine drive for the hydraulic system. Dumping height is approximately 103 in., with a per-bucket capacity up to 6 tons. Models with up to 6-bucket capacity are available.

Pasted Valve Bag

ARKELL AND SMITHS, Canajoharie, N.Y., announces its SSS (super side strength) multiwall bag—a standard pasted valve bag with a reinforcing strip running longitudinally along each edge to reinforce the sides and valve and bottom corners. Advantages claimed by the company for the new product are greater strength, better stacking, and ease of handling.

Enter 213 on Reader Card

(Continued on page 210)

Production at a profit . . . wherever you use it

DIAMOND 77 PORTABLE CRUSHING and SCREENING PLANT

Here are the cost-cutting, production-boosting advantages that put Diamond way out in front:

- ★ **Big, powerful crushing capacity with a 10″ x 36″ jaw crusher and a 36″ x 22″ star gear roll crusher.**
- ★ **Speedy separation of material on a 4′ x 12′, 2½ deck vibrating screen.**
- ★ **30″ wide belt conveyors.**
- ★ **The Diamond "line-flo" rotor-lift principle that guarantees fast, continuous movement of aggregate.**

You get all these in a Diamond plus complete portability . . . a hydraulic mechanism to lower the screen deck to travel position . . . and rugged Diamond construction throughout for practically any type of crushing operation. No wonder reports from the field read like these:

"300 to 400 tons per hour of road gravel in 25% to 35% crush" . . . "less down time, more production" . . . "oversize roll crusher and screens do the trick" . . . "smoothest operating plant we have seen".

And remember . . . Diamond gives you a choice of drives. Mechanical drive with one power unit is standard. Optional drive: (1) one power unit to drive crushers with electric motors to drive screens, rotor-lift and conveyor, and (2) same as No. 1 except for motorized head pulleys on all conveyors.

For complete details, see your Diamond distributor.

DIAMOND IRON WORKS
division
GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place • Chicago 9, Illinois

Everything For The Aggregate Producer

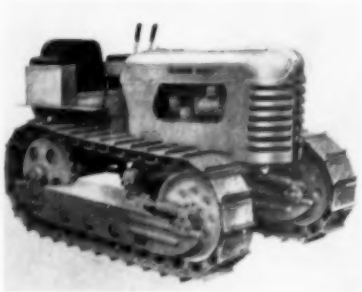
Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants For Rock and Gravel

Enter 1332 on Reader Card

NEW MACHINERY

(Continued from page 208)

Crawler Tractor



THE OLIVER CORP., 400 W. Madison St., Chicago 6, Ill., announces production of the OC-4 crawler tractor, designed to handle a variety of front and rear-mounted attachments. A four-cylinder gasoline engine delivers 22 drawbar hp. Among its features are a four-speed transmission which provides a range of from 1.56 mph. in first gear to 5.26 mph. in fourth, new heavy-duty clutch and modern low silhouette.

Attachments for the OC-4 include dozer, angle blade and many standard three-point hitch attachments such as scraper and scarifier, snow plow and winch as well as other special purpose equipment.

Enter 205 on Reader Card

All-Wheel-Drive Trucks

INTERNATIONAL HARVESTER CO., Motor Truck Division, 180 N. Michigan Ave., Chicago 1, Ill., has added two heavy-duty all-wheel-drive models to its line. Four-wheel-drive model R-190, rated at 29,000 lb. GVW, is available in four wheelbases from 142- to 193-in. Six wheel-drive model RF-190 is available with choice of bodies to provide GVW ratings of 38,000 or 43,000 lb. Four wheelbase lengths range from 157 to 211 in. Both models feature a new front axle design with one-piece center section, and outrigger-type front spring mounting. A range of gasoline or LPG-fueled engines is available.

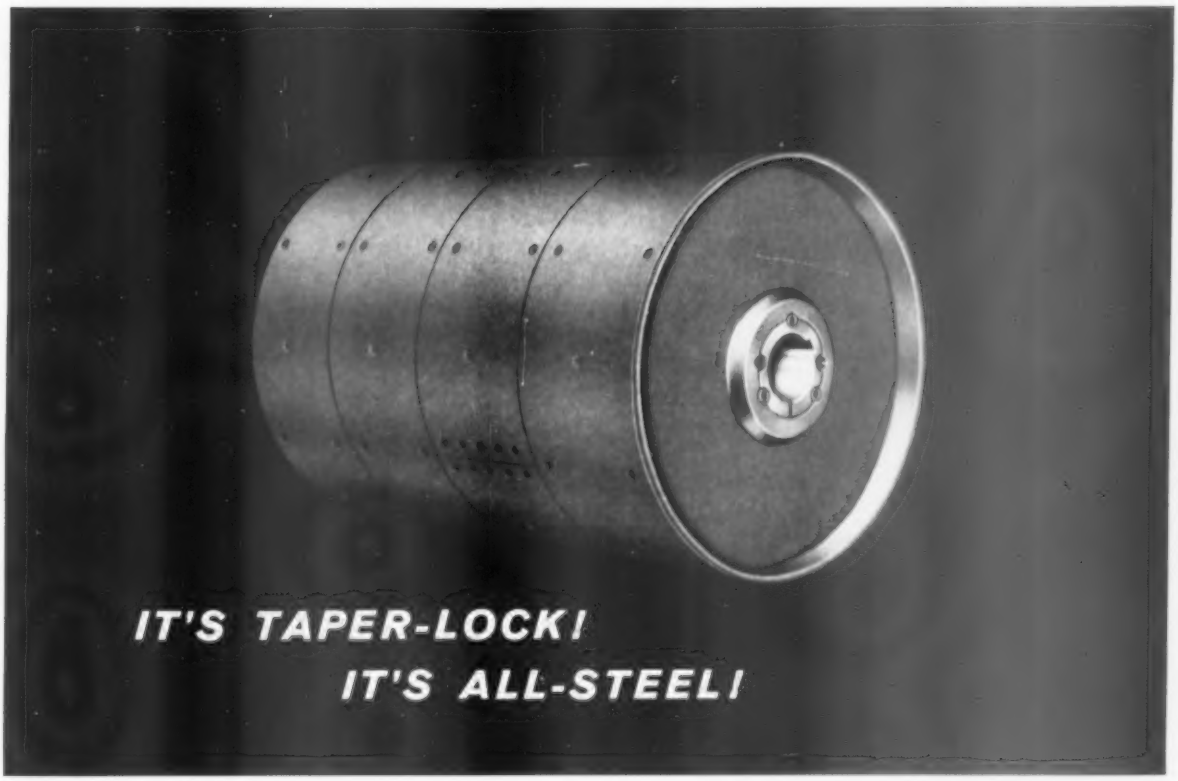
Enter 206 on Reader Card

Bag Filling Machine

KRAFT BAG CORP., 630 Fifth Ave., New York 20, N.Y., announces an improved Kraftpacker model for automatic open mouth bag filling. The machine accommodates weights from 25 to 200 lb. It is said to preweigh material to within 4 oz. plus or minus, even on speeds up to 24 charges a minute. A special flow-gate quadrant on the conveyor may be lowered or raised to reduce or increase production rate. The new unit requires a maximum of 9 ft. 8 in. of head space and 3 x 4-ft. floor space. The standard model has legs and principal working parts of 12 gauge steel, but Kraftpackers may also be ordered in stainless steel.

Enter 207 on Reader Card

END



The modern Conveyor Pulley for superior performance . . .

One tough application after another proves beyond doubt that you can't beat a lagged, Taper-Lock Steel Conveyor Pulley for the hard jobs! Here is the score on their use in rugged coke plant service. In this particular case the installation was on belts from the quencher and loading belts to cars. The report was made after *three years of use.*

1. **One-third saving on initial cost.**
2. **Saving on maintenance; no redressing of pulley faces.**
3. **No appreciable wear on lagging.**

In addition, these Taper-Lock Steel Conveyor Pulleys provide the further benefits which are inherent in their design:

1. **No bolts to shear.**
2. **Easy on — easy off.**

Taper-Lock Steel Conveyor Pulleys have terrific impact capability. All welds are made by the submerged arc process for 100% strength. Taper-Lock's patented back-up bar permits a weld of the full rim thickness to give 100% penetration. And there are no bolts to give way!

Normally available from stock in all face widths and diameters from 6 inches to 8 feet. *Write for bulletin.*

DODGE MANUFACTURING CORPORATION, 2600 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER your local Dodge Distributor. Factory trained by Dodge he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" or write us.

DODGE
of Mishawaka, Ind.

Enter 1330 on Reader Card

how you can profit in heavy digging with BAY CITY reserve power

Just look at the 1 yard rock dipper in this striking action photo—filled to brimming capacity. The 21-foot, heavily reinforced box-type welded boom wields this mighty load with ease and speed. The one-piece continuous chain crowd has automatic tension adjuster and a power dipper trip gives effortless dumping. Reverse crowd mechanism, too, is power controlled.

In any heavy digging, you need power and lots of it. You'll have reserve power to spare with the BAY CITY Model 60, thanks to its husky, 113.5 hp GM diesel engine. And, for maneuverability, you can't beat a BAY CITY. It provides a well-balanced assembly with all machinery and engine mounted on a one-piece, heat-treated cast rotating base. Powerful shoe-type swing clutches combined with balanced hoist and crowd speeds provide smooth operation and a fast digging cycle.

Your heavy digging and material handling will increase profitably; your maintenance and downtime drop off sharply, when you use dependable, powerful BAY CITY equipment.

270

Write today for Bulletin 60-B. Gives complete specifications and working ranges for the fully-convertible 1 yard Model 60 with 21 ton crane rating.

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Enter 1329 on Reader Card

MANUFACTURERS NEWS

Elected to Presidency

William R. Adams

St. Regis Paper Co., New York, N.Y., announces that William R. Adams has been elected president to succeed Roy K. Ferguson, who continues as chairman of the board and chief executive officer. Mr. Adams, who joined St. Regis in 1937, has been vice-president in charge of manufacturing. He is also a director. Mr. Ferguson has served as president since 1934. Edward R. Gay, formerly executive vice-president, has been appointed vice-chairman of the board, and Arch Carswell and Benton R. Cancell, as executive vice-presidents.

Link-Belt Speeder Corp., Chicago, Ill., has announced a second major expansion in two years which can increase by 40 percent the production of power cranes and shovels at its Cedar Rapids, Iowa, plant. According to David W. Lehti, president, the new structure provides increased facilities for assembly, machine shop and other operations.

The Mine & Smelter Supply Co., Denver Colo., has announced that Allan E. Craig, chief service engineer and assistant manager of the Marcy mill division, passed away on April 7 following a brief illness. Mr. Craig had been associated with the company for 35 years and was well known throughout the mining industry for his work in the ore grinding and gravity concentration fields.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., recently dedicated the new 50,000 sq. ft. branch building in Liverpool, N.Y., for the Syracuse branch, which serves Tractor Group dealers in New York State and throughout New England. The program was arranged by Arthur S. Dodd, branch manager and B. M. Bruet, assistant branch manager. Visitors were welcomed by William J. Klein, vice-president and director of sales for the Tractor Group; John C. Walker, eastern territory manager; John M. Haile, construction machinery eastern territory sales manager and C. L. Thompson, material handling sales manager, all of Milwaukee, Wis. Other officials of the Syracuse branch office include S. L. Myers, construction machinery sales manager; Roland C. Clement, engine sales manager; George L. Langill, material handling sales manager and K. A. Mattson, as the farm equipment sales manager.

United States Rubber Co., New York, N.Y., has appointed William J. Reddington as St. Louis district sales manager for the mechanical goods division. He replaces Hugh Reynolds, who has retired after 30 years of service. Mr. Reddington has been with the company since 1933.

Research-Development Post Goes to E. O. Martinson

D. W. Marchant

Harry S. Jeske

Loring Click

E. O. Martinson

Koehring Co., Milwaukee, Wis., has announced the appointment of E. O. Martinson as vice-president in charge of research and development. He was formerly president and general manager of Koehring - Waterous Ltd., Brantford, Canada, and will be succeeded by D. W. Marchant, vice-president and general manager of Koehring Southern, Chattanooga, Tenn. Harry S. Jeske, general superintendent at Koehring Southern, succeeds Mr. Marchant as vice-president and general manager, and Loring Click, assistant to the works manager at Milwaukee, becomes plant superintendent at Chattanooga. Raymond E. Burton, formerly assistant sales manager, has been appointed to the position of assistant director of marketing.

Succeeds Alfred Iddles

M. Nielsen

The Babcock & Wilcox Co., New York, N.Y., announces that M. Nielsen, a director and executive vice-president, has been elected president of the company to succeed Alfred Iddles, who has retired after serving as president since 1948. Mr. Nielsen joined Babcock & Wilcox in 1924, served in various capacities until 1953 when he became vice-president, was elected a director in 1954, and executive vice-president in 1955.

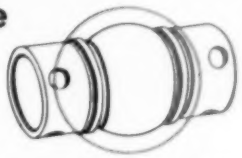
(Continued on page 215)

for heavy-duty shock load service...

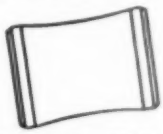
which bearing is best?

	Ball	Tapered Roller	Shafer
Low Friction Loss	✓		✓
Self-Alignment	✓		✓
High Radial Load Capacity		✓	✓
High Thrust Load Capacity		✓	✓
High Shock Load Reserve		✓	✓
Long Life		✓	✓
Fast, Positive Adjustment			✓
Lowest First Cost	✓		
Lowest Over-All Cost			✓

SHAFER Self-Aligning Roller Bearings give you more



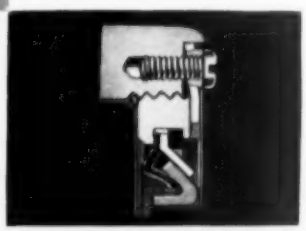
Inner race is segment of a ball.



Roller presents matched curve surface.

Shafer design combines both the low rolling friction of a ball and the high load carrying capacity of a roller. Under shock loads, continuous heavy-duty loads—even under conditions of misalignment—Shafer Bearings maintain full load capacity. You can get off-the-shelf delivery of standard pillow blocks, flange units, flange cartridge units and take-up and frame units. Call your nearby CHAIN Belt District Office, Representative or Distributor.

and...



"Z" seal keeps dirt out ...grease in

Shafer exclusive—"Z" seal is an all-metal, non-rotating, true self-aligning seal that provides positive sealing under severe conditions.

Micro-lock wear adjustment

Shafer® exclusive Micro-Lock provides 12-point adjustment compensating for wear or unusual operating conditions.

Get full information on high bearing capacity. Write for catalog 55A.

CHAIN BELT COMPANY

4649 W. Greenfield Ave., Milwaukee 1, Wis.

Enter 1324 on Reader Card

MANUFACTURERS NEWS

(Continued from page 213)

H. K. Porter Co, Inc., New York, N.Y., has announced acquisition of Federal Wire & Cable Co. Ltd., Guelph, Ontario, Canada, by H. K. Porter Co. (Canada) Ltd., a wholly owned subsidiary. Harold F. Nunn, vice-president and general manager of the Canadian organization, will supervise the new operation. J. Godfrey Smith, founder and president of Federal, has retired but will be available in an advisory capacity. His son, Thomas G. Smith, has been named general sales manager.

Sturtevant Mill Co., Boston, Mass., announces that its newly completed Micronizer pilot plant is now in operation. Four fluid energy mills handle experimental and custom fine grinding and classification to sizes ranging from 20 microns to smaller than one micron. Capacity of the units, which depends upon the size of the mill and the kind of material ground, ranges from a half-pound to a ton or more an hour.

American Marc, Inc., Inglewood, Calif., has acquired complete ownership and management as well as all real and improved property of the diesel engineering division of the Hallett Manufacturing Co., Inglewood, Calif.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed J. S. Morgan as director of domestic sales for the Industries Group. Formerly director of utility sales, he will be on the staff of the vice-president, director of sales. Wallace Collett has been appointed product sales manager, material handling department Tractor Group. He was formerly with the sales training section. John H. Baisley has been named manager of metals industry sales in the Pittsburgh district office; E. E. Ellis, manager of general industrial sales; and L. H. Walker, manager of utility sales.

Morris Machine Works, Baldwinsville, N.Y., has announced the appointment of Edgar A. Rogers as sales representative in northern Alabama, Georgia, and Tennessee, except the western portion of the state, and Roy C. Crumbliss in southern Alabama and southern Georgia.

Cross Engineering Co., Carbondale, Penn., has announced the appointment of Stuart H. Fulkerson as executive vice-president. He will serve as chief administrative officer of the Carbondale operations.

(Continued on next page)

MANUFACTURERS NEWS

(Continued from preceding page)

Fruehauf Trailer Co., Detroit, Mich., announces that Franklin S. Sullivan has been appointed director of the materials handling division to succeed Edwin Avery who has resigned to accept the position of traffic manager for the Detroit Port Commission. Mr. Sullivan has been associated with Fruehauf for the last year and has been in the materials handling field for 21 years. William M. Dawe, formerly manager of the Detroit branch, has been named assistant to the vice-president of sales, and Harry R. Fruehauf, Jr., succeeds Mr. Dawe as Detroit branch manager.

Bucyrus-Erie Co., South Milwaukee, Wis., has announced the appointment of Henry M. Jameson as general manager of the drill division, Richmond, Ind., where the company is building a new 30,000 sq. ft. plant, scheduled for completion in early 1958, for the manufacture of drills. Mr. Jameson joined Bucyrus-Erie as tractor equipment sales manager in 1937. Dean Calland has been named sales representative in the western sales district with headquarters in Phoenix, Ariz.

Wheelabrator Corp., Mishawaka, Ind., announces the appointment of Kenneth E. Blessing as sales manager of the dust and fume control division. He was formerly New York district manager and will be succeeded by Lawrence W. Kohlmeyer, district sales engineer in Chicago. George F. Jones, formerly in the abrasive sales division, Mishawaka, Ind., replaces Mr. Kohlmeyer in Chicago.

Lee Rubber & Tire Corp., Conshohocken, Penn., announces the election of Albert A. Garthwaite, Jr., as president to succeed his father, A. A. Garthwaite, who has been named chairman of the board.

Fuller Co., Catasauqua, Penn., a subsidiary of General American Transportation Co., has opened a new $1½ million plant at Compton, Calif., for the manufacture of rotary compressors, vacuum pumps, preheaters and clinker coolers. The new plant, which occupies 65,000 sq. ft., is also manufacturing products of Sutorbilt Corp., a subsidiary of Fuller Co. H. J. Thompson is general manager of the plant.

Borg-Warner Corp., Chicago, Ill., has announced the appointment of S. G. Gregory as director of personnel services. He has been in charge of personnel activities at the Warner gear division, Muncie, Ind., since 1943.

George M. Darby

Bryant Fitch

Lab Director Retires

Dorr-Oliver, Inc., Stamford, Conn., announces the appointment of Bryant Fitch, research director, as director of the Westport laboratories, Westport, Conn., to succeed George M. Darby, who has retired after 37 years of service. Harry V. Miles and Thomas D. Heath have been named assistant directors. Mr. Darby will continue to serve on a consulting basis. Dr. Elliott J. Roberts is director of research and development of the Westport laboratories. William T. Lindsay has been appointed training supervisor; Frank L. Bosqui, business manager; Robert B. Neill continues as chief chemist; Clarence J. Wall, FluoSolids group leader and David W. Leyshon, group leader, general chemical processing.

John A. Roebling's Sons Corp., Trenton, N.J., has announced the appointment of Elmer A. Trask as Cleveland district manager, wire rope and aircord division. He succeeds Earl A. Frazier, who has been named New York district manager.

Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio, has released a 28-min., 16-mm, color-sound movie, "On the Move," which points out the important role played by shovels, cranes and other roadbuilding equipment in transportation progress. Also covered in the film is the St. Lawrence Seaway project, material handling and general turnpike construction.

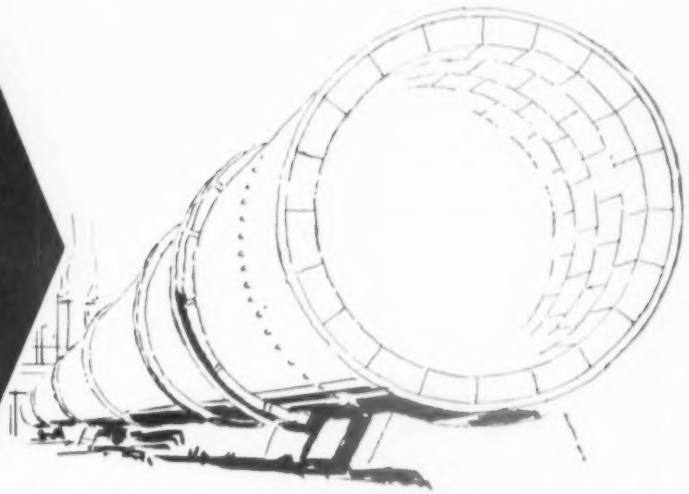
Union Bag-Camp Paper Corp., New York, N.Y., has announced the appointment of William W. Dipman as director of market research and development. He was formerly assistant to the vice-president in charge of bag sales. Prior to that he served as sales representative and district manager for the multiwall bag division.

L. A. Young Spring & Wire Corp., Ottawa, Kan., has announced the appointment of Frank A. Jellesma as regional manager of the Ottawa steel division in Washington, Oregon, Idaho, Montana, Wyoming, northern Utah, British Columbia, Alberta and Saskatchewan. His headquarters will be in Spokane.

(Continued on page 218)

Higher Bulk Density . . . Lower Porosity

the BIG PLUS in



WALSH High Alumina Refractories

Quality control, spearheaded by better research and ceramic engineering, has been largely responsible for the plus values in Walsh High Alumina Refractories for the cement and lime industries.

Their composition of carefully graded and selected minerals, noted for non-shrinking qualities, is further enhanced by the dry press method of manufacture, imparting uniformity of size and shape.

Lower porosity and higher bulk density characteristics account for their increased tensile strength, consequent greater resistance to abrasion, and excellent non-spalling qualities—features that combine to insure better all 'round performance throughout a longer service life at elevated temperatures. Isn't this the kind of performance you've been looking for in your plant? Get the whole money-saving story from your Walsh representative, or write us for details.

WALSH HI LUMITE

60 & 70, Dry Press Process Firebrick (60% & 70% alumina content, respectively).

Uses: High temperature liners for rotary cement kilns and lime kiln linings.

Properties: Non-shrinking; low porosity; higher tensile strength that reduces refractory loss incurred when coating peels off.

WALSH WARCO XXD

High Duty Firebrick, Dry Press Process.

Uses: Cold and hot zone rotary kiln liners and lime kiln linings.

Properties: Greater resistance to abrasive action; higher bulk density; mechanically stronger; clean cut corners and edges . . . true to dimension.

WALSH MULLITEX D

Super Duty Grade Firebrick, Dry Press Process.

Uses: Intermediate zone liners.

Properties: Higher bulk density and lower porosity in super duty grade . . . resistance to thermal shock; greater resistance to abrasion.

Specialists in refractories of high bulk density and low porosity

WALSH REFRACTORIES CORPORATION

101 FERRY STREET • ST. LOUIS 7, MISSOURI

FOR OVER 60 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

Enter 1325 on Reader Card

MANUFACTURERS NEWS

(Continued from page 216)

International Harvester Co., Chicago, Ill., has announced the appointment of Clarence A. Hubert as general manager of the construction equipment division. He was formerly manager of engineering of the farm tractor division.

The Hays Corp., Michigan City, Ind., has elected Philip A. Sprague as president and Donald R. Schoen as executive vice-president.

Dorr-Oliver, Inc., Stamford, Conn., announces that Carlton W. Crumb, director of technical data, passed away on April 6 following a brief illness. He had been with the firm for almost 30 years. Joining the company in 1928, he served successfully as manager of the central sales division, sales and market analyst, and sales promotion manager prior to becoming director of technical data in 1955.

American Cyanamid Co., New York, N.Y., has changed the name of its mineral dressing department to mining chemicals department.

The Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn., has changed its name to Bros Incorporated.

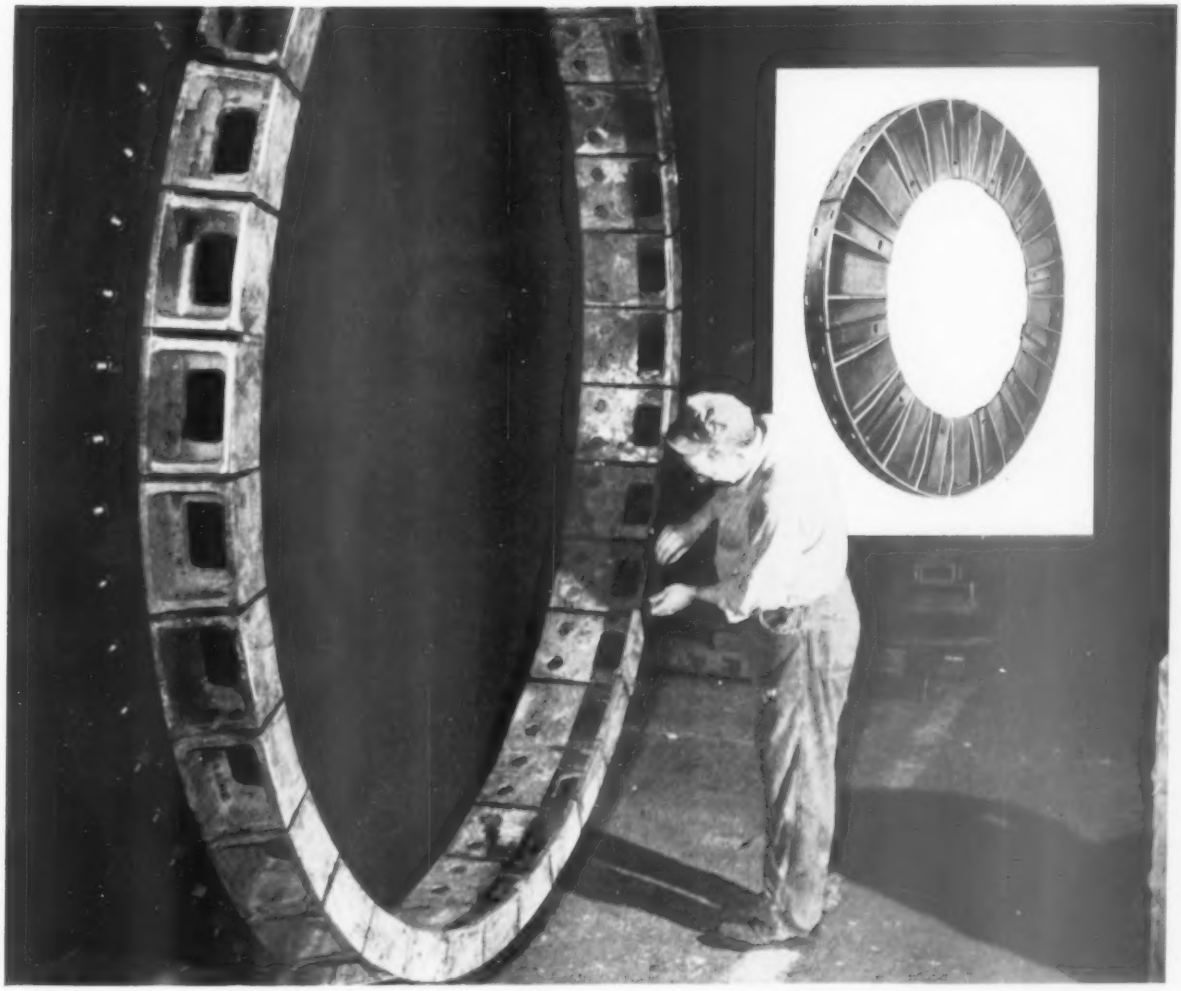
Thor Power Tool Co., Chicago, Ill., announces that John F. Corkery, formerly sales promotion manager, has been appointed vice-president in charge of public relations, advertising and sales promotion. James A. Lind has been appointed vice-president of finance.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has established a new wholly owned subsidiary in Australia, the Allis-Chalmers Australia Pty. Ltd., under the supervision of C. A. Rechne, and through it has purchased the assets of Thomas C. Pollard Pty. Ltd., Newcastle. The plant will continue to make motor graders and will expand production to other types of construction machinery.

Illinois Gear & Machine Co., Chicago, Ill., announces the election of E. C. Wilson as vice-president. He has been associated with the company since 1942.

Lamson Corp., Syracuse, N.Y., announces the appointment of Gifford Kittredge as manager of commercial division with responsibility for all sales and related activities of Airtubes and commercial conveyor systems. He was formerly New York regional manager.

(Continued on page 220)



IN CEMENT, LIME, AND DOLOMITE PLANTS...

B&W Nose and Tail-Ring Castings Demonstrate Longer Continuous Service

Longer brick life and longer continuous service are being attained by 275 kilns in 54 plants using B&W Nose and Tail-Ring Castings. In many cases, the life of these castings has exceeded 9 years.

Light and strong B&W Alloy Castings have improved kiln performance in most installations. Made of heat-resisting Grade HH alloy, nose ring castings eliminate belling out of the kiln shell, assuring longer brick life and longer continuous operation of the kiln. By protecting the end of the kiln shell from direct flame, the nose ring castings prevent "feathering-down" of the shell because of oxidation. Their design eliminates cracking and warping, experienced with large size castings.

Small size and light weight make B&W Castings easy and inexpensive to install. The protecting flange on the nose ring castings permits the use of low-alloy steel bolts for fastening.

Spare part inventory may be kept low because the same nose ring castings may be used on kilns varying up to 4 feet in diameter, depending upon size. Write for Bulletin S-17. The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

S-467

BABCOCK & WILCOX

B&W

BOILER DIVISION

Enter 1326 on Reader Card

MANUFACTURERS NEWS

(Continued from page 218)

New York Rubber Corp., New York, N.Y., has elected Herschel G. Harris as president to succeed Mark H. Stratton, president since 1932, who has retired. Mr. Harris was formerly vice-president in charge of sales of the Airubber division and has been with the company since 1937. C. Bradley Allen, formerly vice-president in charge of sales of the mechanical rubber goods division, who joined the company in 1932, has been elected executive vice-president and also a director.

Clark Equipment Co., Benton Harbor, Mich., announces that Clarence E. Killebrew, vice-president, construction machinery division, was elected president of the Construction Industry Manufacturers Association at the recent annual meeting. Boyd Oberlink, vice-president, Allis-Chalmers Mfg. Co., was elected first vice-president, and Henry Barnhart, vice-president, Baldwin-Lima-Hamilton Corp., second vice-president.

Air Reduction Co., Inc., New York, N. Y., has elected George E. Hawkins as executive vice-president. He joined the company in 1917, has been vice-president since 1941, and a director since 1949.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces the retirement of Herbert H. Kessler, specialist in the sale of processing machinery equipment in the Philadelphia district, after 22 years of service.

Denver Equipment Co., Denver, Colo., has appointed William T. Ahlborg as executive vice-president and general manager. F. J. Griesemer has been named assistant general manager. Mr. Ahlborg has been with the company since 1938 and served previously as vice-president and secretary.

Four Wheel Drive Auto Co., Clintonville, Wis., has announced the appointment of Arthur J. Sturwold as district sales manager in Illinois, Michigan, northern Indiana and eastern Missouri. He has been serving as transport sales representative in Illinois since 1955.

Harnischfeger Corp., Milwaukee, Wis., has announced the appointment of Robert Losse as director of industrial relations and personnel of all the plants. He will be succeeded as general manager of the Escanaba, Mich., plant by Paul Diefenderfer, formerly manager of the Los Angeles shop and service operation.

Thew Shovel Co., Lorain, Ohio, has established a new research and development department with Spencer Bowman as manager of research and development. He formerly served as manager of machinery research and development for Westinghouse Air Brake Co.

Gardner-Denver Co., Quincy, Ill., announces that J. W. Gardner has been named coordinator of new products development. A member of the board of directors, Mr. Gardner previously served in the engineering and sales departments.

Dorr-Oliver, Inc., Stamford, Conn., announces the appointment of Glen G. Reed, former manager of sales services, as director of the filtration technical division, and Glenn O. Wilson, former industrial sales manager, as director of the industrial technical division. He succeeds the late William B. Gery, who passed away suddenly on January 1, 1957. Other appointments include: T. T. Meehan, manager of sales services; William T. Marston, industrial sales manager; Richmond T. Stampley, assistant to Mr. Marston; Robert P. Hughart, manager of industrial sales, Mountain division; and Donald T. Tarr, Jr., manager of the western division. E. L. Oliver, Jr., has been appointed assistant to the president in addition to his duties as vice-president.

Western Machinery Co., San Francisco, Calif., announces that Jack H. How, president, was honored recently by the San Francisco Chamber of Commerce with the "Award of Progress" for consolidating operations of the company's several divisions into a completely remodeled five-story warehouse. The award is given to those firms with building or expansion programs that create new employment and improve surroundings.

Crane Carrier Corp., Tulsa, Okla., has announced purchase of the Available Truck Co., Chicago, Ill., which was founded 50 years ago and will be operated as a division of the company.

John A. Roebling's Sons Corp., Trenton, N.J., has appointed Earl A. Frazier as New York district sales manager for the wire rope and aircord division covering New York, northern New Jersey and New England. He was formerly Cleveland district sales manager.

Rockwell Spring & Axle Co., Chicago, Ill., has announced the appointment of N. R. Brownyer, vice-president, as director of engineering of the Timken-Detroit axle division.

END

Why this feeder doesn't cave in

● The reason is simply this: *The* PIONEER-ORO *Feeder is the most rugged feeder ever built.*

Take a look at its massive pans . . . cast from a special wear-resistant manganese steel, heavily ribbed, reinforced, and all the way from 3/16" to 1" thick, depending on width of feeder. The pans are supported by heavy, closely-spaced manganese steel rollers, keyed 3 to a heavy diameter shaft. Each shaft turns in 3 heavy-duty bearings rigidly supported on the feeder frame.

Takes heaviest dump loads

The PIONEER-ORO is designed for the roughest, toughest feeding jobs on earth. It withstands the impact of the heaviest dump loads. It shrugs off abrasion from hard ores, slag, flintrock, granite, and other coarse, heavy materials.

But the mighty PIONEER-ORO offers more than sheer, brute strength. It is a smooth-running, finely engineered unit designed to deliver a constant flow of heavy, abrasive material, with a minimum of maintenance. Even preventive maintenance costs are low.

Rivetless pans overlap and interlock

Pans, for example, overlap and interlock to provide added stability and stop leakage and spilling. Upturned end flanges also reduce loss of material. Drive links are cast as an integral part of the pan, so there are *no bolts or rivets that can loosen.* Easily replaced link bushings need no lubrication.

Sprocket teeth are readily reversed or replaced without taking the sprocket hub from the shaft or even disconnecting the pans. Like all other wearing parts, these teeth are cast from special wear-resistant manganese alloyed steel.

Supporting rollers and shafts can be removed, too, without disturbing the pans.

OTHER FEATURES

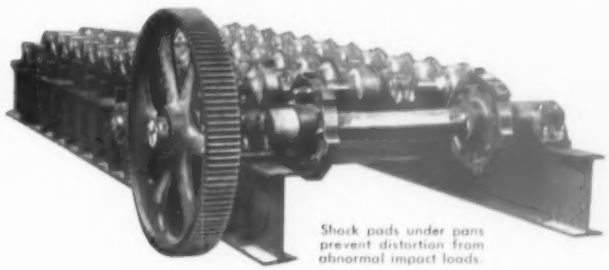
1. Patented lugs in pan links remove dirt, make links self-cleaning.
2. Feeder can be made to run in either forward or reverse direction.
3. Available in standard widths up to 84", widths in excess of 84" by special order, and lengths as required.
4. Made with 6", 9", 12" or 15" pan pitch (depending on width) to fit available head room.

PIONEER-ORO FEEDER
Capacities in tons per hour

Travel per Min.	Width of feeder						
	30"	36"	42"	48"	60"	72"	84"
10'	74	108	147	192	300	432	588
15'	112	162	222	289	450	648	888
20'	148	216	294	384	600	864	1176
25'	186	270	368	482	750	1080	1472
30'	223	324	442	577	900	1296	1768

Ask Your Feeder Salesman These Questions

1. Are pans made from special manganese steel? How thick?
2. Are pans and links cast together so they are rivetless?
3. Can manganese parts be replaced without disassembling pans?
4. Are rollers keyed to shafts which turn in heavy bearings?



Shock pads under pans prevent distortion from abnormal impact loads.

Note the turned-up end flanges and corrugated surface of heavy interlocked pans; also absence of rivets.

For further details and specifications regarding full line of PIONEER Feeders, write Pioneer Engineering, Minneapolis 14, Minn. (Division of Poor & Company, Inc., Chicago) or see your nearest PIONEER Distributor.

Pioneer®
EQUIPMENT

Pioneer Engineering, 3200 Como Ave. S.E., Minneapolis 14, Minn.
Division of Poor & Company, Inc. ● Chicago
Please send information on equipment checked.

- ☐ GRAVEL PLANTS
- ☐ WASHING PLANTS
- ☐ MECHANICAL FEEDERS
- ☐ ROCK PLANTS
- ☐ BITUMINOUS PLANTS
- ☐ VIBRATING SCREENS
- ☐ JAW CRUSHERS
- ☐ APRON FEEDERS
- ☐ BUTTER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS
- ☐ ORO FEEDERS
- ☐ CONTINUOUS CONVEYORS

Name_____
Company_____
Address_____
City_____ Zone___ State_____

Enter 1375 on Reader Card

BONDED EQUIPMENT BARGAINS

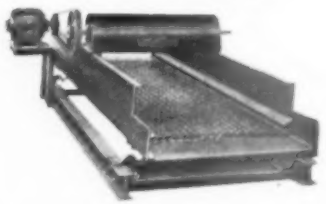
NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® HEAVY DUTY VIBRATING SCREENS

HEAVY DUTY MODELS, TYPE BS: Four bearing positive throw eccentric shafts; 3' x 6' to 5' x 14', 1 to 5 decks. Write for New 8-page Bulletin No. 1087.

Model Number	No. of Decks	Screening Area	Sale Price
124AS	1	2' x 4'	$ 443
224AS	2	2' x 4'	472
126AS	1	2' x 6'	472
226AS	2	2' x 6'	501
136AS	1	3' x 6'	581
236AS	2	3' x 6'	688
336AS	3	3' x 6'	956
188AS	1	3' x 8'	675
238AS	2	3' x 8'	815
338AS	3	3' x 8'	996
336BS	3	3' x 6'	1393
486BS	4	3' x 6'	1447
138BS	1	3 x 8'	1231
288BS	2	3 x 8'	1282
338BS	3	3 x 8'	1375
248BS	2	4' x 8'	1865
848BS	3	4' x 8'	2035
2410BS	2	4' x 10'	1953
3410BS	3	4' x 10'	2365
2412BS	2	4' x 12'	2319
3412BS	3	4' x 12'	2435
4412BS	4	4' x 12'	2833

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



GENERAL DUTY SCREENS, TYPE AS: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for New 8-page Bulletin No. 1086.

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Pre-Fab sections quickly and easily jointed together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2⅞" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$ 722
14"	50'	2222	1144
14"	85'	3377	1733
16"	20'	1262	826
16"	45'	2137	1088
16"	60'	2642	1359
16"	90'	3712	1909
18"	25'	1477	794
18"	45'	2317	1166
18"	70'	3142	1648
18"	85'	3697	1925
18"	100'	4252	2220
18"	130'	5362	2797
20"	25'	1517	826
20"	60'	2882	1522
20"	75'	3467	1838
20"	90'	4052	2145
24"	25'	1590	898
24"	45'	2430	1350
24"	70'	3480	1875
24"	100'	4740	2514
24"	120'	5580	2950
24"	150'	6840	3603
30"	50'	2911	1617
30"	70'	3871	2119
30"	90'	4831	2614
36"	25'	1818	1118
36"	45	2858	1678
36"	60'	3638	2096
36"	100'	5718	3214

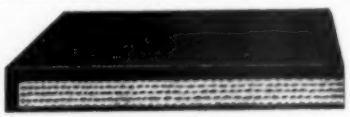
For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting. Write For Bull. #1138.

For 14" belt	$16.84 per foot
For 16" belt	18.04 per foot
For 18" belt	19.24 per foot
For 20" belt	20.37 per foot
For 24" belt	21.78 per foot
For 30" belt	24.75 per foot
For 36" belt	27.95 per foot

Bonded troughing idler conveyors are also available with truss type construction. Write for Bulletin #1189 and prices.

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck ⅛" top rubber cover by 1/32" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	List Price	Sale Price
14"	4	$3.52 foot	$2.83 foot
16"	4	3.96 foot	2.97 foot
18"	4	4.38 foot	3.29 foot
20"	4	4.83 foot	3.80 foot
24"	4	5.68 foot	4.26 foot
30"	4	6.97 foot	5.21 foot
36"	4	8.26 foot	6.18 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. This belt is for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
16"	4	$4.71 foot	$3.46 foot
18"	4	5.23 foot	3.83 foot
20"	4	5.73 foot	4.37 foot
24"	4	6.74 foot	4.94 foot
30"	4	8.28 foot	6.07 foot
24"	5	7.90 foot	5.78 foot

The following belts are 5-ply, 32 oz. duck:

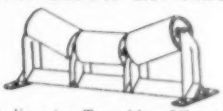
Width	Top Cover	Bottom Cover	List Price	Sale Price
24"	⅛"	1/32"	$ 8.56 Ft.	$ 6.42 Ft.
30"	⅛"	1/32"	10.52 Ft.	7.89 Ft.
36"	1/32"	1/32"	14.21 Ft.	10.66 Ft.

A heavier duty 28 oz. duck belt with ⅛" top rubber cover x 1/32" bottom rubber cover having 3500# to 4000# average cover tensile, 20# to 24# average friction pull. For the higher abrasion resistance applications and handling of materials where more strength is required to give greater belt life.

Width	Ply	List Price	Sale Price
18"	4	$5.67 foot	$4.20 foot
20"	4	6.22 foot	4.61 foot
24"	4	7.32 foot	5.41 foot
24"	5	8.53 foot	6.31 foot

Other widths, plies, duck weights and cover thicknesses available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable prelubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from $61.00. Write For Bulletin #1188.

NEW BONDED® FEEDERS

For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded Troughing Idler Conveyors, thus eliminating the necessity of two motors. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #1182.

Priced from $275.00

BONDED CONVEYOR PARTS FOR NEW OR OLD CONVEYORS

Holdback
$99.00

Return Belt Guide Idler
$11.75

Self-Aligning Idler
$60.75

Head & Tail
$149.00

Wing Pulley
$71.00

Carry Belt Guide Idler
$14.50

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213, HU 6-3156**

128 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

GOOD USED COAL STRIPPING EQUIPMENT

5480 Marion Electric 15 yd. Shovel
1600 P&H Electric 6 yd. Shovel
4500 Manitowoc 5 yd. H. L. Shovel
88-B Bucyrus Erie 4 yd. Shovel-Drag.
1601 Lima 4 yd. Standard Shovel
120-B Bucyrus Erie 4 yd. Electric Shovel
1201 Lima 3½ yd. Standard Shovel
1055 P&H 3½ yd. Standard Shovel
111-M Marion 3 yd. H. L. Shovel
1201 Lima 2½ yd. H. L. Shovel
955 P&H 2½ yd. Standard Shovel
3500 Manitowoc 2 yd. H. L. Shovel
Unit 1020 ¾ yd. Shovel
625 Page Diesel Drag, 160', 9 yd.
6160 Monighan Drag, 160', 8 yd.
625 Page Diesel Drag, 150', 10 yd.
4500 Manitowoc Drag, 140', 4½ yd.
621-S Page Diesel Drag, 135', 6 yd.
7-W Monighan Elec. Drag, 120', 7 yd.
618 Page Diesel Drag, 120', 5 yd.
5-W Bucyrus Monighan Drag, 120', 5 yd.
2400 Lima Dragline, 130', 5 yd.
111-M Marion Diesel Drag, 80', 5 yd.
1055 P&H Dragline, 80', 3½ yd.
1201 Lima Dragline, 85', 3 yd.
955 P&H Dragline, 90', 2½ yd.
604 & 802 Lima Cranes
1201 Lima Comb. Shovel & Crane
51-B Bucyrus Erie Shovel & Drag
38-B Bucyrus Erie Shovel & Backhoe
600 Reich Heavy Truck Mounted Rotary Air Drills
McCarthy Coal Auger Drill
Compton Coal Auger
Mayhew Rotary Truck Mounted Air Drills
Portadrill Truck Mounted Air Drills
Euclid Trucks—Bottom & Rear Dumps
Bay City, Lorain, P&H, Northwest & Osgood Truck Cranes
Caterpillar, International & Allis-Chalmers Bulldozers

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FOSTER QUALITY — FULLY GUARANTEED

RELAYING RAILS

Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.

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SPECIAL CRUSHING-GRINDING PLANT

Hardinge ball mill 8'x36" 100 HP AC motor complete, spare new liners available
Hardinge ball mill 8'x48" 200 HP AC motor Falk reduction gear; 15 tons balls
F. S. Smidth tube mill 6'6"x21' Silex brick lined, 350 HP 180 RPM syn. motor 17 tons Nikard steel balls, new discharge head
Pennsylvania 8XT-15 hammermill 350 HP 900 RPM syn. motor, extra new shaft, discs, many spare parts. Motor rewound; prac. new condition
2 W. S. Tyler-Hummer screens 4'x10' two deck
Jeffrey vibrating feeders 2 12"x30" 3 18"x30"
Two bucket elevators 58' high 14"x8"x8¼" buckets
Inclined bucket stone elevator 126' long 14"x8"x8¼" buckets; 24"x76¼" steel housing
3 Williams Mdl. 278 hammermills, V-belt drive.

CONCRETE MIXERS

Ransome Model 84S, 3 yd. tilting type
Smith 422, 4 yd. tilting type
Koehring 568 2 yd. tilting type
Koehring 288 1 yd. stationary type

TRUCK MIXERS

30 Jaeger, Rex, Smith 3 to 6½ cu. yd. high discharge, horizontal, truck mounted as is or remanufactured

CRUSHERS—KILNS—DRYERS

Jaw: Acme 10x20, 15x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 10x16, 20x36. Diamond 24x36". Cedar Rapids 10x20, 15x36, 20x36, 25x40. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Buchanan Type C 30x42, 36x42. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Pioneer 30x42. Universal 18x24.
GYRATORY: Al-Chal 322, 6', 7½', 8, 9, 9K, 10, 20 and 30 Telsmith 8S, 28" Intercone,; Kennedy Van Saun 7, 19, 25⅝-8, 37½, 38; Traylor TY 1'8", 4' Type TS, TY 3', T2 3', TZ 3'.
ROLL: Cedar Rapids 40x20. Pioneer 40x22. Pioneer 30x18. Telsmith 24x16. Universal 40x24, 18x30.
HAMMERMILL: Jeffrey Type H3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 24x30, Cedar Rapids 50-50, 30x33. Penn Model 8XR 100
BALL MILL: Hardinge conical 8'x36", 5'x18", Gates 5'x22", Marcy 77, Int. X-18 5'x6'.
TUBE MILLS: 5'x16', 5'x20', 5'x22', 6'x12'.
ROD MILL: Jackson & Church 4'x10' 10 ton rods, new. Marcy 3x8, 5x12, 6x12, Ruth 4'x11'.
AUTOCLAVES: Jackson & Church bolted head 50'x6' "Quick Acting" head 50'x6'6".
CONE: Symons 2' and 3' coarse bowl.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 6'x72', Vulcan 9x100, 10'6"x105', 8'x10', 6'x90'.
DRYERS: Louisville 6'x30', 6'x50', others 4'6"x40', 7'x80', 6'x90' complete with motor. NEW.
COMPEB MILLS: A-C 7'x24' with motor drive.

CRUSHING PLANTS

Cedar-Rapids AA-2225 primary port. Diesel.
Cedar-Rapids 3033 hammermill Diesel. Trailer mtd.
Eagle washing plant, classifier sand screws, screen.
Pioneer 150 Primary 2036 Cat D8800 Diesel.
Pioneer Port. 3042 **New 1955 Never used.**
Austin-Western 101 Port. Diesel.
Pioneer Duplex Prim. 936 AFB Second. 2040 rolls.
Aus-West. 2540 Port. Primary.
Pioneer Port. 11x36 jaw, 40x20 rolls.
Pioneer 24V Gravel Plant.
Amer. Good Roads 15x30, Diesel. Complete.
Universal 20x36 jaw, 30"x18" roll, plant complete.

CONCRETE PLANTS AND EQUIPMENT

Erie Strayer port. concrete mix plant 25 yds. per hr.
Blaw-Knox BCPC-400 HI cement bin. Complete.
Butler 600 bbl cement bin. All equipment.
Noble CA-245, complete plant, almost new.
Johnson 135 yd. 4 compt. 150 bbls cement, 750 bbls silo U.S. Corps Engrs. automatic.
Johnson 200 ton automatic 3 compt. aggr. with Heltzel 400 bbl. cement 797 cement silo.
Johnson 150 yd. 5 compt. aggr. 870 bbl. cement bin.
John. 6-cpt., 600-T Ag., C 300-bbl., Stlo 600-bbl.
Mixermobile 2 yd. 45' tower. Extension to 155'.
Cement bin 250 bbls overhead storage with 375 bbls cement recirculator ground storage stlo
Fuller Kinyon Type C 6" cement unloader.
Burmeister 175 tons 3 cpt. 2-475 bbls cement bins.
Rex 160, 190, 200 Pumpcretes, complete.

SAND AND GRAVEL HYDRAULIC DREDGES

Morris 16"x16". Portable. Electric.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete.
Elliott 8" with cutter. Diesel Hull 48'x18'x3'6".
20" Elliott Diesel 155'x19'x8'.
8" Hydraulic Diesel. On 32'x8' steel pontoons.
Amsco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
8" H&B twin Diesel drive. Complete.

SCREENS

Tyler F-360 4'x12' 2 deck w/spray bars.
Trommel 6'x15' 75 H.P. elec. motor.
Kennedy Van Saun 3'x10' 3 deck.
Tyler-Niagara 3 deck 7½ H.P. A.C. motor.
New Holland 4'x12' 4 deck.
Telsmith 5'x12' dbl. deck elec. motor.

RICHARD P. WALSH CO.
30 Church St. New York 7, N.Y.
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QUARRY EQUIPMENT

Cedarapids 2540 jaw only.
Cedar Rapids 936 Jaw Crusher.
Cedar Rapids 3042 Double Impeller. Rebuilt.
New Holland 30 x 20 Roll Crusher. Rebuilt.
36" x 12' apron feeder.
Cedarapids 4' x 12' and 4' x 14' double deck screens.
12" x 35' inclined open elevator. New.
Pioneer 4' x 8' double deck screen.
27½ ton, single-compartment, 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two-compartment, 13' x 23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.
18" diameter x 20" face magnetic pulley.

SHOVELS AND CRANES

P&H 855 2-yard diesel powered shovel-drag.
Lorain 82 2 yd. Shovel.
Bucyrus-Erie 38B, 1½-yard diesel powered dragline.
Koehring 304, ¾-yard diesel powered clam-crane-hoe.
General ¾-yard gasoline powered crane-shovel-hoe.
Northwest 25, ¾-yard diesel powered crane-drag.
Link Belt LS-85 ¾-yard diesel powered shovel-drag.
Lima 34 Paymaster ¾-yard diesel shovel. Good.
Unit 1020 ¾-yard diesel powered shovel-crane.
Lorain L-26 ¾-yard diesel powered clamshell.
Lorain L-40 ¾-yard diesel powered clam-crane-drag shovel.
Lorain TL-20 diesel powered backhoe.
Insley K-12, ½-yard gasoline powered backhoe.
Link Belt LS-50 backhoe, gas power.
Lorain MC-504-W crane clam. Reconditioned.
Lorain 8P-110 self-propelled crane.
Michigan T6-K Truck Crane 35' boom.

TRACTORS, TRUCKS, SCRAPERS, ETC.

1—Euclid 18-yard twin engine scraper. Very good condition.
1—Euclid 15.5-yard scraper. Excellent condition.
1—Euclid 12-yard overhung engine scraper.
1—Euclid 7-yard overhung engine scraper.
1—Euclid TUD 10-ton rear dump.
3—Euclid 12-yard bottom dumps.
2—Euclid tractors with 3200 gallon water tank semi-trailer.
1—Euclid Model 3 BV loader.
1—Caterpillar DW-10 scrapers.
1—Caterpillar DW-10 with Athey side dump.
1—Allis Chalmers HD-10 tractor with hpdraulic bulldozer blade.
1—International TD9 crawler tractor.
1—International TD18 with Bucyrus-Erie bulldozer blade. Excellent condition.
1—Caterpillar D-7 with cable bulldozer blade, winch.
1—Caterpillar D-8 with cable bulldozer blade.
1—Austin Western diesel powered grader.
1—Adams diesel powered grader.

DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 RPM. Rebuilt.
Cat. D13000, 145 H.P. at 1000 RPM. Rebuilt.
GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

ASPHALT PLANT

Barber-Greene 848 Model with drier, gradation unit, etc.

AIR COMPRESSORS

105 cu. ft. Ingersoll-Rand gas portable.
500 cu. ft. Gardner-Denver diesel portable.
600 cu. ft. Gardner-Denver diesel portable.
500 cu. ft. Ingersoll-Rand, Waukesha power.
420 cu. ft. Gardner-Denver two-stage stationary. Rebuilt.

L. B. SMITH, INC.
Camp Hill, Pa.
Phone Harrisburg REgent 7-3431

FOR SALE

ONE BRAND NEW 16" SUPERIOR McCULLY GYRATORY CRUSHER. NEVER BEEN USED AND ONE SLIGHTLY USED DUE TO CHANGE OF PLANS

DOLESE & SHEPARD CO. (La Grange, Ill.)
Phone: Fleetwood 4-2800 • Ask for MR. DOODY

INGERSOL RAND Gyro-Flo 600 cfm Portable Compressor, new 1954, Waukesha engine for gasoline, butane, propane. Excellent. $6750. Rental Purchase. Yard.
NORTHWEST 80D Shovel, #18700, used 7 months, like new. $56,000.
BUCYRUS ERIE 22B Electric Mine Shovel, 1 cy., new 1953. A1. $13,500 Yard.
P&H 255A Shovel ¾ cy. #12469, new 1950, rebuilt. (New Front). $7500 yard. Rental Purchase.
CEDARAPIDS 22 x 36 rb. Jaw Crusher Portable Primary Plant w/feeder, Cat. diesel, under-conveyor, mounted factory tandem rubber. A1. $21,000 Rental Purchase.
UNIVERSAL Secondary Plant w/3018 rb. rolls, #3 Hammermill, 4 x 12 screen, rotovator, 30" conveyors, tandem rubber, diesel power, overhauled. 100-150 tph. $16,000 Yard. Rental Purchase.
CEDARAPIDS Rock-It Portable w/2225 jaw, 3033 hammermill, 4 x 10 screen, twin GMC power, tandem rubber. Perfect. $27,500.
PIONEER 54 x 24 Triple Roll Portable Plant, mdl. 5309, w/feed & discharge conveyors, tandem rubber. Excellent. $17,500.
CEDARAPIDS 20 x 36 roller brg. Jaw Crusher. $5000.
PIONEER 15 x 36 rb. Jaw Crusher & Plate feeder. $3750.
AUSTIN WESTERN 9 x 40 rb. Jaw Crusher. $1650 Yard.
PIONEER 9 x 36 pb. Jaw Crusher, good. $850 Yard.
UNIVERSAL 10 x 24 pb. Jaw Crusher, Good. $750 Yard.
CEDARAPIDS 8 x 12 rb. Jaw Crusher. $600 Yard.
ROGERS 10 x 18 rb. Jaw Crusher. $750 Yard.
ROGERS 10 x 16 pb. Jaw Crusher, good. $500 Yard.
AUSTIN WESTERN 4 x 40 rb. Jaw Crusher. $1350 Yard.
CEDARAPIDS 30 x 20 rb. Double Roll, new shells. $2500.
MCLANAHAN 18 x 36 Single Roll Crusher, rebuilt. $1850 Yard.
(4) **ALLIS CHALMERS** 5 x 10 Lo-Head horizontal screens w/motors. Good. $1500 each.
SIMPLICITY 4 x 12 2-deck horizontal screen, A1. $2250 Yard.
SIMPLICITY 4 x 12 2½-deck Screen, used 1½ seasons. $2500 Yard.
SIMPLICITY 4 x 8 3-deck hvy. duty D vibr. Screen. Perfect. $1850 Yard.

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11 C Y Dumps
Heavy Duty Axle & Springs
AIR & 11;00 TIRES
DOUBLE FLOOR.
EXCELLENT CONDITION
PRICES & PICTURES

FELL VAUGHAN
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DID YOU BENEFIT FROM SOMETHING YOU READ IN "ROCK PRODUCTS"

Elsewhere in this issue is a special card to make it easy to subscribe for a friend or employee.

Why not pass along the card to people you think should be reading ROCK PRODUCTS every month.

CRANES & SHOVELS

Bantam "M-49" ⅜ yd. Hoe, mounted Chevrolet Tandem Truck.
Marion "331" ¾ yd. Shovel or Dragline.
Unit "514" ½ yd. Trench Hoe.
Link-Belt Shovel Attachment complete for LS-85 (¾ yd.).

LOADERS

Caterpillar "D-16" Diesel Tractor w/Hi-Lift Cable Traxcavator, 1950 model in fine shape.
International "TD9" Drott Hydraulic Front End Loader, new tracks, reconditioned throughout.
Barber-Greene "545W" Used Rubber-Tired Bucket Loader.

MISCELLANEOUS

Gruendler "1024" Roller Bearing Jaw Crusher.
Parsons "21" Ladder-type Crawler-Mounted Trenching Machine, digs 9' deep.
Pettibone-Wood "820A" New Windrow Proportioner. Reduced for quick sale.
Pettibone-Wood "840A" New Windrow Spreader Box. Offered at discount.
Pettibone-Wood "P620" Used Preparizer, G-M Power, Diesel. Will rent or sell.
Bayport 21 yd. New Aggregate Bins.
Transport "GPX-16" 16-Ton used Low Bed Semi Trailer w/Ford F-7 Tractor.
Jaeger 3 yd. (4¼ yd. Agitator) Hi-Discharge mixer, 1945 model, mounted on 6-wheeler. Cheap.

NOTE: All This Equipment Located in our Yard

120 S. PIERPONT **PHONE 4-6706**

EIGHMY EQUIPMENT CO.
ROCKFORD, ILL.

FOR SALE

1—53x60 heavy-duty, double-impeller, Iowa Mfg. impact breaker, complete with 50"x14' 6" heavy-duty cast manganese feeder. Used 7 months.

2—42" conveyors. One conveyor 155' long; the other 160' long. Used 7 months.

1—McCully gyratory crusher #11

1—Marion electric shovel, Model 6RS.

Numerous other units, including ½-yard to 2½-yard shovels; Murphy & GMC power units, & generator sets. Screens, jaw crushers, rolls, bucket elevators, etc. Some units mounted on rubber-tired chassis.

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WANTED

GOOD USED TROUGH IDLERS 18" & 24", ANY AMOUNT.
LATE MODEL VIBRATING SCREENS.
JAW CRUSHERS, ALL SIZES.
GEARMOTORS 3 to 15 H. P.

FOR SALE

CONVEYOR & ELEVATOR PARTS

125' x 60" USED CONVEYOR BELT.
92' x 54" ALMOST NEW CONVEYOR BELT.
170' x 42" NEW CONVEYOR BELT.
57' x 36" ALMOST NEW CONVEYOR BELT.
485' x 24" ROUGH TOP PACKAGE BELT.
280' x 14" ALMOST NEW CONVEYOR BELT.
433' x 16" 7 PLY NEW ELEVATOR BELT
225' x 16" 6 PLY ALMOST NEW ELEV. BELT.
150' x 12" ROUGH TOP USED BELT.
2000'—8" to 14" TRANSMISSION BELT, ALMOST NEW.
75—24" PLAIN BEARING TROUGH IDLERS.
130—30" PLAIN BEARING TROUGH IDLERS.
115—36" PLAIN BEARING TROUGH IDLERS.
83—42" ANTIFRICTION TROUGH IDLERS.

G. A. UNVERZAGT & SONS INC.
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1—Allis-Chalmers 7' x 24' Two-Compartment Compeb Mill with 500 HP motor.
1— F. L. Smidth 8' x 132' direct heat Rotary Kiln, ¾" welded shell.
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2—Bartlett & Snow 7' x 30', 6' x 30' direct heat Rotary Dryers complete with feeders, blowers, motors, 304 S.S. Clad 17' from feed end.
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150' Screw Conveyor 14" and 18" dia. with steel troughs and covers.
1—Rectangular Two-Compartment Bin 22' 8" long x 20'6" wide x 18' deep.

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80 ton Porter Diesel Elec. Loco.

35 ton Plymouth Diesel Locomotive.

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Lidgerwood 2D Hoist & Swinger, 90 HP Buda Diesel Engine.

2 100 HP Lucey Portable Horiz. Fire-Box Boilers. 200 lbs. Oil Fired. ASME.

30 ton Wiley Stiffleg Derrick. 80' Boom.

600 CFM 1-R Gyroflo Diesel Compressors.

4 yd. P&H 1055 Dragline new 1950.

Whisler Equipment Company

Affiliated With

Mississippi Valley Equipment Company

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DEPENDABLE USED MACHINES

Special: Eagle 20" x 25' fine material washer; complete with electric motor.

Telsmith 4 x 10 screen	B-G #358 hopper car unloader	NW 1 yd. crane
5 x 12 Meanbi screen	Universal 880 Jr. port. plant	P&H 255A crane
16 x 16 roll crusher	Cletrac DGH with Drott loader	42" Oro feeder
24 x 48 magnetic pulley	Terratrac 400 with gas. power	30" recip. feeder
20" x 38' port. conveyor	Allis Chalmers 1½ yd. loader	30" x 200' conveyor

This equipment rebuilt in our modern plant by expert mechanics. Come see it.

10002 Southwest Highway — TRACTOR & EQUIPMENT CO. — Oak Lawn, Ill.

BARGAIN: 8x125' Kiln with 7 x 51' Cooler. **DRYERS:** 4 x 20, 4½ x 36, 5 x 24, 60 x 60 x 10 x 101. 54" x 70" solid bowl Bird **CENTRIFUGE** 1200 HP 1050 KVA Diesel Elec. **POWER PLANT.** **CRUSHERS:** 440, 961, 1016, 1020, 1030, 1036, 1040, 1224, 1524, 1536, 1836, 2036, 2236, 2436, 2540, 2642, 4836, 4042, 4248, 8466. **JAW.** #19 37½, 38½ Kennedy, 12B, 16A, 36" Telsmith, 16", 20" 36" McCully **GYR.** 2, 3, 4' **CONES.** **PLANTS:** AW81, Univ. 880, CR Super tandem. **MILLS:** 6 x 8, 6 x 15 Ball, 2222, 4033 Hammer. ⅝, 1, 1½, 2 & 2½ yd **SAUERMANS** **CONVEYORS:** 18 x 30, 18 x 70, 24 x 60, 36 x 151, 42 x 160. **FEEDERS:** 2 x 4, 3 x 10, 3 x 12, 4 x 14 Apron. **WASHERS:** Eagle 14x14', 24x18', 24x25', 7x30. Noble CA215 **BATCH PLANT** 12, 14 & 16' **AIR SEPARATORS.** **SHOVELS & DRAG:** Lorain 80J, L90, 820. Lima 802, 1201, 2400. NW5, 6, 7 & 80B. Osgood 908. Link Belt L850. Bucyrus 22B, 38B, 44B, P&H 955, 1055. Manitowoc 4500.

Repres: Bonded Scale and Machine Co.

MID-CONTINENT EQUIPMENT CO., INC.
8321 Gannon St. Louis 24, Mo. Wydown 1-2826.

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60"x48" to 6"x3"

New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.

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29 Washington Ave., Hamden, Conn.

CLASSIFIERS—
Dorr 26' bowl with rakes.
Telsmith 36" x 25' sand drag.

COLLECTOR—Ducon Wet, 10,000 CFM.

PAN CONVEYORS—24" x 18'—30" x 33'—36" x 54'

ELEVATOR—Open inclined 90' centers with 15 x 14" buckets.

GRIZZLY ROLLS—Frame contains six 12" dia x 36" ribbed live rollers.

HAMMERMILL — Pennsylvania S-6.

SCREENS — 4' x 6'6" Dble Deck Gyrex. 60" x 84" Model 421 Rotex.

SEPARATOR — Dings magnetic cross-belt.

MOTORS — Two 75 HP, 720 RPM GE Squirrel cage 440 Volt, 3 Phase, 60 Cycle.

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ROTARY DRYERS & KILNS: 6' x 60'; 4'6" x 40'; 4'6" x 32'; 3'6" x 25'; 3' x 24'.

ROTARY COOLERS: 104" x 30'; 104" x 70'. Submerged Type

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AL. CH. 6' x 16' BALL TUBE MILL 30 HP.

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PERRY EQUIPMENT CORP.

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STevenson 4-3505

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1 Motor, electric 40/20/27 H.P. Allis-Chalmers, three speed, 1740/870/1150 R.P.M. open type, 3 phase, 60 cycle, 440 volt,
1 Motor, electric, 10 H.P., G.E. 1160 R.P.M., 220 volt, 3 phase, 60 cycle, double extended shaft,
1 Motor, electric, 40 H.P. Allis-Chalmers, 865 R.P.M., 3 phase, 60 cycle, 440 volt, slip ring open type,
2 Locomotives, 8 and 12 ton, 36" gauge Plymouth,
2 Hammermills 24" x 24" Eagle Crusher Company, excellent condition.

For further information contact J. H. Clements,

BASIC INCORPORATED

Maple Grove, Ohio; P. O. Fostoria, Ohio

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2—4' SYMONS CONE CRUSHERS
ONE NEEDS SOME PARTS

I. M. HELLER, INC.

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LU 65752

Plymouth 25 ton gas locomotive. Others.
Lima 1201 diesel 3½-yd. shovel-crane-drgl.
Koehring 6-yd. Dumptors, Euclid rock trucks.
Johnson, Noble concrete batching plant (2).
Crushers, jaw and gyratory, (5), large.
Barge cranes, steam (2), 45-65 tons.
Shovels; diesel, elec. 1½ to 12 yds. (7).

H. Y. SMITH CO.
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Available throughout the U.S.—Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Draglines	Loaders	Pavers
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Barges	Dredges	Mixers	Rail
Buckets	Drills	Motors	Scales
Belting	Derricks	Mills	Screens
Cableways	Engines	Machine-tools	Stackers
Cars	Excavators	Pulverizers	Shovels
Compressors	Feeders	Pipe	Tanks
Conveyors	Graders	Pumps	Tractors
Crushers	Generators		Trailers
Dryers	Hoists		Etc., Etc.
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(I can sell your surplus equipment)

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CEMENT KILN BURNERS NEEDED

LAKE ONTARIO PORTLAND CEMENT CO., LTD.

PICTON, ONTARIO

Preference—Five years minimum experience actual burning. Rotary Kiln dry process using coal. Complete operational familiarity required. Age brackets 40-55. Industry standards for remuneration. Top seniority in a new plant.

Please reply in writing, giving full details in confidence, to:

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Consulting Management Engineering

10 EGLINTON AVE., EAST, TORONTO

MORE-WEAR STEEL PALLETS

MADE FROM HARDER, TOUGHER, LONGER LASTING STEEL

LAST LONGER — COST NO MORE

Available in all standard and special sizes

CALL—

MILLS-WOLF STEEL COMPANY

10006 Carnegie Ave. — SW 1-4333
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WANTED

Schaffer or Kritzer continuous lime hydrator—10 to 15 tons per hour capacity. Also Raymond No. 1, 2 or 3 automatic pulverizer with integral whizzer separator.

BOX P-26, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

WANTED

3 DRUM ELECTRIC HOIST, FAIRLY MODERN, 18000 to 22000 LINE PULL. MOTOR OR SWINGER NOT NEEDED.

YONKERS CONCRETE PRODUCTS INC.

P. O. Box 565, Yonkers, N.Y.

MOTORS AND GENERATORS
All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.
Expert Repair Service
NUSSBAUM ELECTRIC COMPANY
220 E. Douglas Ave., Fort Wayne, Ind.

Lancaster 6' dia. Vert. Mixer 25 HP
Kent Model #2 Continuous Mixer
Raymond #00 and #1 Pulverizers
Kilns, Dryers, Filters, Hammer Mills, Crushers
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Tel: Sterling 8-1944

RAILS—All Sections
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TRACK EQUIPMENT, FROGS—CROSSINGS—TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS
M. K. Frank Grand Central Palace, New York; 401 Park Bldg., Pittsburg, Pa.; 105 Lake Street, Reno, Nevada

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"Can you use this part for a Type B Erie Steam Crane or Shovel?"
1—Smoke Stack and Cover, Part S-219
New—Never Used—Priced to Sell.
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FOR SALE
Dwight-Lloyd Sintering Machine
42" x 264" Type E
Good Condition
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WHAT ARE YOU PAYING FOR REPAIRS?
The money you are paying to keep wornout equipment working may be just enough for you to own better equipment.
SEE THE
"WHERE TO BUY"
SECTION

WANTED HELP — POSITIONS

CONTROL CHEMIST
for
Lake Ontario Portland Cement Co. Ltd.
$8,000 – $9,000

Our client requires a competent individual (35-45 years of age) to set up and operate a laboratory to control a cement manufacturing plant.

It is preferred that the candidate have ten years' supervisory experience in a cement plant using dry process and coal fuel. The man must be capable of training staff and handling customers' technical problems, etc.
Please reply in writing, giving full details in confidence, to:

STEVENSON & KELLOGG, LTD.
Consulting Management Engineering
10 Eglinton Ave. East, Toronto.

SUPERINTENDENT
Crushed Stone quarry 100 miles south of San Francisco. App. 70 employees. Write, giving complete details of experience, education and salaries earned. Confidential.
GRANITE ROCK COMPANY
P.O. Box 151 Watsonville, Calif.

CHEMIST
Experienced, Analytical chemist with limited experience in cement manufacture. Indoctrination period. Eastern location. State salary requirements in detailed resume of personal data, education and experience.
BOX P-39, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

REAL OPPORTUNITY WANTED— 7 years selling to concrete products plants. 2 years in concrete block business. Background also includes contacts with architects, contractors, retail & wholesale building material dealers. Want association with concrete products or ready mix business—possibly with supplier to the industry. 37 years old, college training. Administrative & practical mechanical background. BOX P-36, ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill.

CHIEF ENGINEER
Experienced Chief Engineer required by Canadian Cement Company. Thorough knowledge of design and operation of cement plants necessary. Age 30 to 50 years. Attractive position in a progressive company.
Send application to:
BOX P-19
ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

CHIEF ENGINEER
Permanent position with excellent future and good salary for college graduate mechanical or mining engineer, age up to 45, with several years of successful experience in the design and application of crushers and all other types of aggregate production machinery and with engineering department administrative experience. Location mid-west city with very good living conditions. Give age, complete outline of education and experience. State salary expected and enclose recent photo. Replies kept confidential.
BOX P-41, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

WANTED
An experienced superintendent to take complete charge of a limestone quarry operation in northwestern city. The position requires a man who can handle all phases of production, sales and promotion.
Box P-21, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

BUSINESS OPPORTUNITIES

QUARTZITE QUARRY FOR SALE
156 acres of an unlimited deposit of a high grade, highly refractory quartzite, including also 11 acres of trucksite property with trackage to accommodate 15 cars daily.
Quarry is fully developed and ready for operation. Located in South Central Wisconsin. Low freight rates to many parts of the country. Have market for good size tonnage for all year round shipments. Here is a real opportunity for a capable party to get into a permanent and profitable business who can turn out volume.
BOX P-40, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

CALIFORNIA GRAVEL PIT FOR SALE
Business well established, concrete gravel, road rock that packs, plaster and cushion sand, top soil, fill. Used by State. 40 acres. We wish to retire. $150,000.00. Terms.
UNITED BUILDERS & FARMERS SUPPLY
P. O. Box 96, Soquel, Calif., Near Santa Cruz

MARINE CONTRACTOR QUARRY OPERATOR
Have strategic locations for the production of derrick stone and riprap. Ideal material for breakwaters and jetties with sufficient material on hand to influence winning large project. Experienced rock man seeks financing on partnership, percentage or fixed unit price per ton.
BOX P-45, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

CONSULTING ENGINEERS AND SERVICES

Quarries
Crushing Plants
Cement Plants
Storage Methods
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E. LEE HEIDENREICH JR.
CONSULTING ENGINEERS
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9 South Clinton St., Chicago 6, Ill. Ph. Franklin 2-4186

Operation
Plant Layout
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EVANS & ASSOCIATES
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FOUNDATION TESTING, CHEMICAL ANALYSIS
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THOMASVILLE DRILLING & TESTING CO.
THOMASVILLE, PENNA.

Try A Small Ad For Quick Results

INDEX TO WHERE TO BUY

FREE SERVICE for Buyers

Get information and prices quickly on machinery, equipment. Check item (or items) about which you desire information. Send to us.

*Specify type.

Send to: Research Service Department
ROCK PRODUCTS
79 West Monroe St. Chicago 3, Ill.

___Admixtures, Aggregate
___Aftercoolers, Air
___Agitators*
___Aggregates (special)*
___Air Compressors
___Air Separators
___Asphalt Mixing Plants
___Bagging Machines
___Bags*
___Barges
___Batchers
___Belting, Conveyor, Elevator, Power Transmission*
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits*
___Blasting Supplies
___Block Machines,* Concrete Building
___Bodies, Trailer*
___Brick Machines and Molds
___Buckets*
___Bulk Cement Handling Equipment
___Bulldozers
___Cars, Industrial
___Central Mixing Plants
___Classifiers
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___Concentrating Tables
___Concrete Forms
___Concrete Mixers*
___Concrete Mixing Plants
___Concrete Specialty Molds
___Concrete Waterproofing and Dampproofing
___Conveyors*
___Crushers*
___Coolers
___Cranes*
___Curing Equipment
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills*
___Dryers
___Dump Bodies*
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service, Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
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___Flotation Equipment
___Front End Loaders*
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media*
___Gypsum Plant Machinery
___Hard Surfacing Materials
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___Hoppers
___Kilns: Rotary, Shaft, Vertical
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___Lubricants*
___Magnetic Separators
___Masonry Saws
___Mills*
___Pipe*
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___Screens*
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___Shovels, Power*
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___Tanks, Storage
___Tires and Tubes
___Torque Converters
___Tractor Shovels*
___Tractors*
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

Your Name _____ Title _____
Firm Name _____
Street _____
City _____ State _____

RP-6-57

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...For a New Standard of Teamwork on the "Rock Routine"!

Daybrook builds a complete line of steel dump bodies and hydraulic hoists for *all* quarry and mine operations.

Many body types are available in a wide selection of capacities. And, Daybrook Speedlift® Hoists are offered in a range of conventional arm, direct-lift, telescopic, and "Power-Up"—"Power-Down" models. An outstanding feature of conventional arm and direct-lift hoists is the one-year warranty on the sealed hydraulic cylinder.

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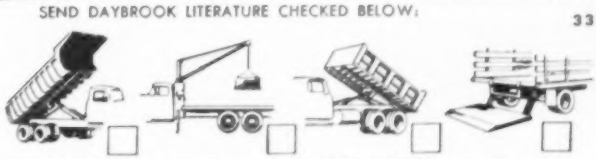
Your Daybrook distributor will be glad to tell you about the many Daybrook exclusive body and hoist features that mean more profitable operation on the "rock routine."

SEND DAYBROOK LITERATURE CHECKED BELOW: 33



ROCK BODIES—HOISTS ☐ POWER LOADER ☐ EXCAVATOR BODIES—HOISTS ☐ POWER GATE ☐

Sign below, attach coupon to letterhead, and mail in envelope.

Name

DAYBROOK *Speedlift*® **TRUCK EQUIPMENT**

LAYCO

DAYBROOK HYDRAULIC DIVISION
L. A. YOUNG SPRING & WIRE CORPORATION
BOWLING GREEN, OHIO

INDEX TO DISPLAY ADVERTISERS

(Continued on page 232)

WEMCO MOBIL-MILL Heavy Media Separation Plant

Save $1.00 or more per yard of concrete

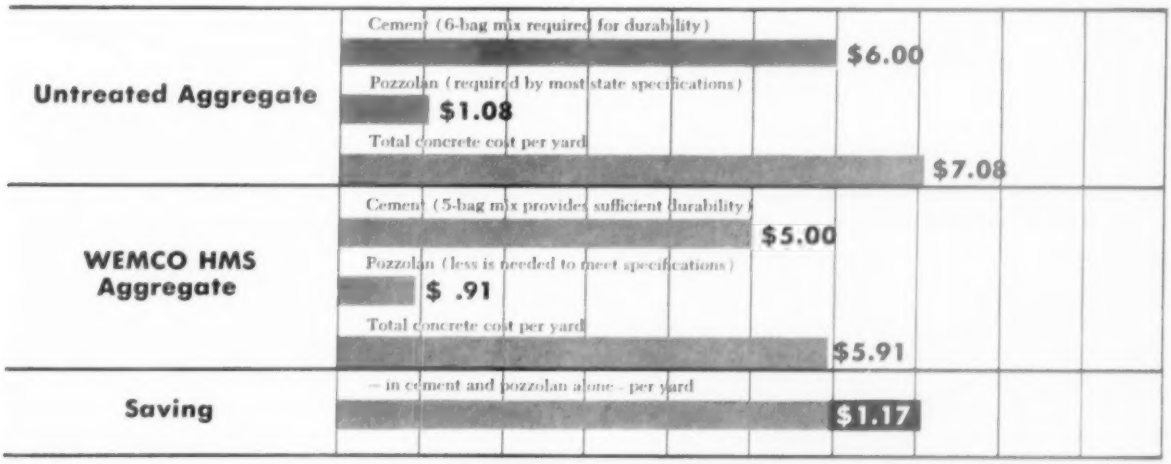
where aggregate requires HMS treatment

If you *sell* aggregate: WEMCO **HMS** will give you a better market, especially where specifications are tight.

If you *buy* aggregate: WEMCO **HMS** will lower your cost of producing better concrete by more than $1.00 per yard.

If you *specify* aggregate: WEMCO **HMS** can give concrete of greater strength and durability, as proved by state tests.

Below are the facts – composite figures based on actual operating results – demonstrating a saving of over a dollar per yard of finished concrete, using WEMCO **HMS** treated aggregate. Operating costs for WEMCO **HMS** are low – only a fraction of the actual dollars-and-cents benefits you'll obtain. Check with your WEMCO representative today, or write for details.



WEMCO

WESTERN MACHINERY COMPANY
650 FIFTH STREET
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HD-21 crawler tractor, 204 net engine hp
315 scraper, 20 yd heaped, 15 struck

YOU CAN STRIP OVERBURDEN AND RECLAIM LAND PROFITABLY

with this crawler tractor-scraper team

There is a marked trend toward reclaiming worked-out pits—and a parallel trend toward the use of Allis-Chalmers crawler tractors and scrapers. Both are examples of wise management.

Land Reclamation—already a law in many states—eliminates to a large extent the scarred and worthless landscapes left by abandoned pits and piles of overburden. Properly reclaimed land usually returns far more than the cost of reclamation in higher resale value. Even where pits can be only partially filled, the land may be seeded profitably for pasture.

Allis-Chalmers HD-21 Crawler Tractor and 315 Scraper are ideal for this type of operation. This team is mobile and flexible enough to strip overburden and spread it immediately in a worked-out area of the pit. This eliminates the need of re-handling overburden and of calling in specialized equipment.

Curved and offset cutting edge on the scraper, plus torque converter drive on the tractor, are just two of many features that put this Allis-Chalmers team in a class by itself for this type of work. Let your Allis Chalmers construction machinery dealer give you the details. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

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CLAMSHELLS. For all-purpose digging and materials rehandling. Two through six part reeving permits wide range of closing power and speeds. Equipped with ESCO Two-Piece Teeth for faster handling of compacted materials.

DIPPERS. For any stick connection. General purpose, Heavy-Duty, Coal Loader, Mesabi Type—to your specifications, your job requirements.

NO DIGGING PROBLEM TOO TOUGH FOR ESCO BUCKET SPECIALISTS

DRAGLINES. Featherweight, Medium-Weight, Heavy-Duty, Extra Heavy-Duty and Tapered for any excavating or loading job.

ORANGE PEELS. Full leaf, semi-leaf, and digging leaf, three-point grip for fast, efficient handling of rip-rap, boulders, stumps, logs and scrap.

HOES. FASTBACK® design eliminates drag and heeling action in trenching and back filling jobs. Sixteen tip widths. Cutting widths from 20" to 62". Digs equally well with or without side-cutters.

Draglines, dippers, hoes, clams, orange peels—*ESCO* builds them all to handle your toughest digging requirements. Drawing upon years of design and fabrication experience, *ESCO* engineers can build a bucket for your job that will:

INCREASE YARDAGE: *ESCO* Buckets are job-tailored . . . to solve your specific digging problems.

CUT COSTS: Critical wear points are alloy steel castings. High strength-weight ratios are achieved through all-welded construction. *ESCO* buckets are available with *ESCO* quick-change two-piece teeth. Seven different point shapes for faster digging.

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*Unitized Kiln Liner**

T3

* Patent applied for: U. S. A., Canada, Mexico

Saves up to Half the Production Usually Lost in Kiln Down-Time!

Now you can eliminate the costly process of inserting steel plates and cardboard spacers between bricks while lining your cement kiln—*and let the time saved earn profits in extra production.* Already operators have reported 30 to 50% savings in installation time!

The unique Kaiser Chemicals development that makes this possible is the bonding of accessories to Kaiser Periclase-Chrome Brick. And in addition to increasing production by drastically decreasing installation time, you get these extra benefits:

•Assures Correct Installation—When installing Kaiser T3 Unitized Kiln Liners, shims are automatically aligned between all bricks. And because part of the shim overlaps the hot face, it is easy to see by visual inspection that all bricks are placed correctly, hot face inside.

•Takes the Guesswork Out of Expansion Allowances—The thickness of the adhesive that bonds the steel shims to the brick automatically provides the correct allowance for circumferential expansion. The bonded cardboard spacers give added protection by assuring correct provision for longitudinal expansion. No additional spacers are needed.

•Coats Faster—When the kiln is fired up the overlapping part of the shim melts, oxidizes, and combines with the feed to speed formation of hot zone coating.

•Reduces Inventory Problems—Because the shims and cardboard spacers are bonded to the brick *at the factory*, you need no separate orders or stock records for them. And, in turn, your materials handling costs are reduced.

Let us show you how this new Kaiser Chemicals development can help you reduce kiln down-time *and* give you longer liner life. Contact your Kaiser Chemicals sales engineer now.

Kaiser Unitized Kiln Liners are available in all sizes of the standard 9" x 6" x 3½" Series Arch Brick and Wedge Brick. Write or call for descriptive folder.

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